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SECOND GEOLOGICAL SURVEY OF PENNSYLVANIA.
1876-'7.

REPORT OF PROGRESS.
I.I.

OIL WELL RECORDS AND LEVELS.

BY
JOHN F. CARLL.

PUBLISHED IN ADVANCE
OF
REPORT OF PROGRESS I.I.I.

HARRISBURG:
PUBLISHED BY THE BOARD OF COMMISSIONERS
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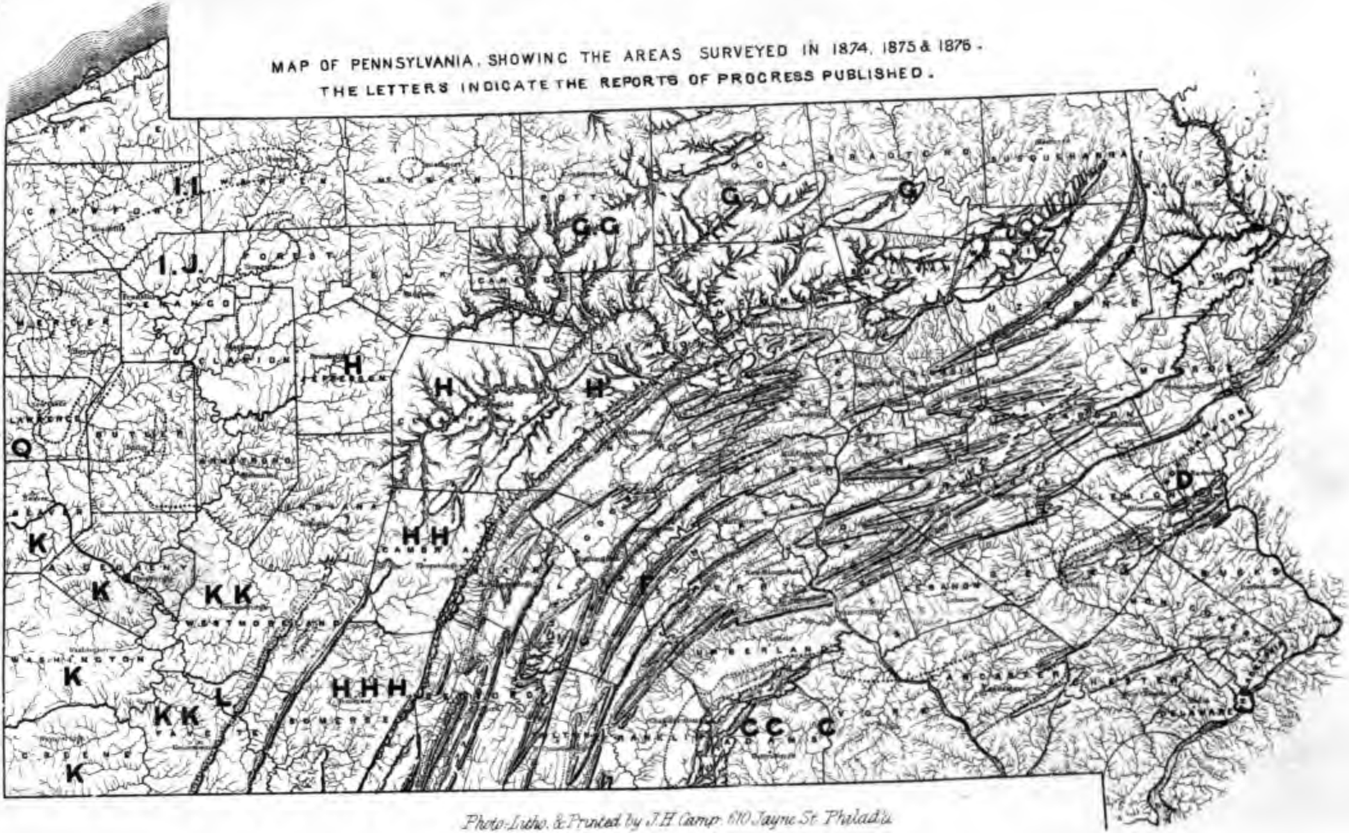
1877.

MAP OF PENNSYLVANIA, SHOWING THE AREAS SURVEYED IN 1874, 1875 & 1876.

THE LETTERS INDICATE THE REPORTS OF PROGRESS PUBLISHED.



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PREFACE TO I.I.

The volume of Oil Well Records now published as prepared by Mr. John F. Carll, assistant in charge of the survey of the Oil Region of Pennsylvania, is unique of its kind, and will doubtless be considered an important contribution to geology,—not only the geology of Pennsylvania, but of the world.

For the first time geologists are now put in possession of a large collection of authentic, well considered and classified mass of facts, made up with great pains and carefulness, in the face of many difficulties, with the help of oil well owners and operators, not only during the progress of the survey, which commenced in 1874, but during ten years of a previous residence in Venango county.

To Geologists of other States and countries this collection of facts will be peculiarly acceptable, as it will furnish them with precise and abundant information by which to comprehend and pass judgment upon the statements of American geologists, often vague and always generalised regarding the age, habitation and relative abundance and quality of that remarkable light fuel in which the entire civilized world is now commercially interested.

To oil men at home it will be equally valuable and acceptable—first, as giving them on a larger scale and spread over a wider area, the information which each one possesses accurately enough already, but only in a partial and local manner, and second, as providing them with what may be called the first edition of an Oil Well Gazetteer.

To owners and operators in the Oil Region the Geological Survey of Pennsylvania has this to say for the book which it now publishes for their benefit:—Judge it, gentlemen, by your own experience. Think, what have been your own difficulties in obtaining such information. Think, also, what this book might have been if you and your predecessors had combined from the beginning of the history of oil well boring to arrange and enforce a bureau of oil well records. Instead of the more or less doubtful record of 2,000 wells which this book presents to you, you might have had a still more trustworthy and better arranged list of 20,000 wells.

Such thoughts always come too late to redress an error. The past is hopelessly lost. But the future is still our own. This book, if it were to have no other worth, would be invaluable as a lesson of what may be done. No good reason can be assigned why from now on, in coming years, oil well records should not be collected, arranged and recorded for the benefit of each and all.

This volume is published as preliminary to Mr. Carll's second Report of Progress. His first Report of Progress was marked I. This volume is marked, according to the system of publication adopted by the Board of Commissioners of the Survey, I.I. It is, however, only the *basis* upon which Mr. Carll is writing his second report, which will soon be published with the mark, I.I.I.

The facts which are here given in a separate volume, partly with the design of preventing the second report from swelling to too great a size, partly because it will be in demand by those who care very little for any detailed report, and partly in order that references to the *printed pages* and *running numbers* of this volume may be made by Mr. Carll in the text of his report—the facts thus published separately and in advance will be explained, criticised and combined in that report, so that the geology of the Oil Regions may be better understood.

It is not unsafe to say that the geology of the Oil Region is now practically in its main features established. But questions still remain unanswered; and the obstacles which stand in the way of giving perfectly satisfactory answers to some of these questions seem almost insuperable. We know, however, that nothing in science is hopeless. We live always on the verge of discovery. The merest accidental circumstance sometimes pours a flood of light upon the darkest geological territory. We should not, however, wait on such contingencies. Patient and intelligent investigation is always at our command, and on this alone true science relies.

The survey of North-western Pennsylvania is far from being completed. We cannot rest satisfied until we have demonstrated the relationships of all the rocks bored through in the wells with all the outcrops in the belt of country north of the oil field, from Olean to Sharon, and from Franklin to Erie. We should also have a perfect connection of sections between Titusville and Warren, between Warren and Bradford, between Bradford and Ridgeway. We must make it still plainer how the red rocks of the wells connect themselves with the red rocks of Driftwood and the Allegheny Mountain base, and with the red rocks of Potter and Tioga counties and the Catskill Mountains. We must connect more conclusively the mountain sands of the Allegheny river with the Vespertine (or Pocono) sandstones in the gaps of the Chestnut Ridge and Laurel Hill at Blairsville, Johnstown and Connellsville. And in the opposite direction, westward, we cannot consider the survey finished while a shadow of doubt remains on the exact detailed identification of the Oil and Mountain sands with the Sub-carboniferous and Waverly sandstones and conglomerates of Ohio.

In all these directions the Geological Survey is pushing its field work this year, and some of the most important of the above mentioned questions will probably be nearly, if not quite, settled by the work which different field parties are vigorously prosecuting in Warren, M'Kean, Forest, Elk, Indiana and Lawrence counties.

But there are other and more important, because more practical, questions still which can only be answered within the limits of the Oil Region itself and by the help of such oil well records as are published in this volume—questions relating chiefly to the extent of the oil bearing sands sideways and downwards. To these questions Mr. Carll has given his steadfast and close attention. His views will be published in his forthcoming report. I have neither the right nor the wish to anticipate them; nor would it suit the purpose of this book; but I have a right to say here that I concur with his results, although to the correctness of some of them I have been converted only by the abundance and strength of his facts and ar guments, and in spite of old and deeply grounded prejudices in favor of other views. I believe that intelligent observers in the oil regions will come in time to place entire reliance on the soundness of Mr. Carll's opinions, and will repay him for his long, laborious and anxious investigation with that honor which true science is sure in the end to win.

J. P. LESLEY.

1008 CLINTON STREET, PHILADELPHIA, *July* 21, 1877.

NOTE.—By an accidental shifting of the numerous documents received from Mr. Carll *after* the wells had all been numbered consecutively, it was discovered, but too late in the composition of the volume for the error to be rectified, that numbers 140 to 281 had been passed over. For this error I alone am responsible. J. P. L.

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A COLLECTION

OF

OIL WELL RECORDS.

1874–1877.

BY J. F. CARLL.

CHAPTER I.

The First Systematic Collection and Discussion of Records of Venango County Oil Wells, made in 1868 *and* 1869, *by Mr. E. S. Nettleton, C. E.**

In the fall of 1868 the first systematic attempt was made to ascertain the direction and dip of the Oil Sands of the Venango region and the true relation which the oil producing rock of one district bears to that of another.

This was during the great Pleasantville oil excitement, when, probably for the first time, the attention of a large class of operators was called to the fact that there was a marked difference between the oil and oil sand of the Pleasantville and surrounding districts and the oil and oil sand of Oil creek.

Previous to that time very few levels had been taken, and those only locally from well to well on the same farm, or within the bounds of one producing centre; but some of the detached districts had been fortuitously connected by lines of levels run for pipe lines from station to station, and by preliminary railway surveys which crossed the country in almost every direction. From these sources it was ascertained that the Pleasantville oil rock, although called the 4th sand, lay at a higher elevation than the 3d sand of Oil creek.

---

* Published separately in the proceedings of the American Philosophical Society, January 19, 1877, Philadelphia.

Some operators held the opinion that the oil rocks spread horizontally under the whole country, and that by drilling deeper at Pleasantville the Oil creek 3d sand would be found, and a much larger supply of oil obtained. Others contended that the rocks dipped towards Oil creek, and the Pleasantville wells had already reached the Oil creek sand. They went still further and, pointing to the old failures in the Pleasantville district, averred that there was no oil in the rock when these wells were put down, but that the flooding of the oil sands under the valley of Oil creek, by the abandonment years before of so many wells, had forced the oil from its original home there to these higher portions of the rock.

Discussions on these points showed the necessity for more information on the subject; and while some chose to gain this information on their own account by sinking wells deeper at considerable expense to see what might be below, a few believed that something could be learned by a careful study of the wells already drilled, in connection with a series of surface levels extending over a large area, embracing in one system all the main oil producing centres.

As an outgrowth of this idea an informal meeting was held and a committee appointed to plan and carry out the work necessary to be done. Mr. E. S. Nettleton, then residing in Pleasantville, consented to act as one of the committee, and to undertake the task of running the lines of levels and collecting the well records. A circular was issued to well owners, and blanks were prepared for filling in the well records, of which the following are copies:

Circular A.

Pleasantville, Pa................1868.

Dear Sir:—A pressing need has long been felt by the more thoughtful operators in the Pennsylvania oil regions for a more thorough and accurate knowledge of the thickness, dip and general characterstics of the oil bearing rock in this section. The drillings in different localities have established data sufficient for operations in those particular places, but no effort has been made to connect these together in one comprehensive whole, and very little is known as yet of the relative positions of the oil-bearing rocks in these several localities. In order that this want may be supplied a fund has been raised, a committee appointed to supervise the work, and the services of a competent engineer secured. It is proposed to make an accurate topographical survey of Pleasantville, Enterprise, Bean Farm, Pithole, Shamburg, Bull Run and Pioneer oil districts, and then by a comparison of the records of a large number of the most prominent wells in said districts, to prepare and publish a report, which we think will contain facts and figures of great value to those engaged in the development of oil territory. In furtherance of this object the enclosed series of questions have been prepared, which we hope you will be so kind to fill out and return to us, and any further information you may be able to give will be duly acknowledged.

Signed S. Q. Brown, George K. Anderson, J. H. Herbert, John F. Carll, E. S. Nettleton, committee.

Address all letters to E. S. Nettleton, civil engineer, box 45, Pleasantville, Pa.

Circular B.

Pleasantville, Pa................1868.

DEAR SIR:—Please fill out the following blank and mail to E. S. Nettleton, civil engineer, box 45, Pleasantville Pa.:

Record of..	Well No.	......
Located on		Farm.
Lease No ..... tested......................................		186..
Distance from surface to top of First or "Mountain" Sand,	No. of feet	......
Thickness of the First Sand............................	"	......
Distance from surface to top of Second Sand.............	"	......
Thickness of Second Sand............................	"	......
Distance from surface to top of Third Sand...............	"	......
Thickness of Third Sand..................................	"	......
Distance from surface to top of Fourth Sand.............	"	......
Thickness of Fourth Sand.	"	......
Distance from surface to top of Fifth Sand..............	"	......
Thickness of Fifth Sand..................................	"	......
Distance from surface to Sixth Sand.......................	"	......
Thickness of Sixth Sand	"	......
What is the entire depth of your well?.....................	"	......
At what depth were the mud veins?......................	"	......
At what depth is the seed bag ?..........................	"	......

How far is the bottom of working chamber from the bottom of the well?.............................. No. of feet. ......
Is your well cased?.............................. ......
Quality of the oil-bearing rock, pebble or sand? ....
What color of oil is produced?.............................. ......
Gravity of oil? ....
What has been your best production per day?............ ...... bbls.
How many engines would the best flow of gas run? ....
What is the engineer's number of this well as marked on the Samson post?.............................. ......
Remarks..

During the winter of 1868–69, the work was prosecuted with considerable interest and diligence; but like all other matters not directly personal, it soon began to be neglected by the committeemen, who were all deeply engaged in their own affairs, and Mr. Nettleton was left to work out the problem as best he could almost alone.

Meantime the field widened. New developments at Scrubgrass and Parker's Landing led off to the south, far beyond the limits proposed for our work. Mr. Nettleton had been attracted to the west, and connected himself with the Engineering Corps of Greeley Colony, which made it necessary for him to close up his affairs in the Oil Regions preparatory to his removal. No one had any personal interest in continuing the investigation, and the work stopped just when it should have been carried forward, leaving the materials in hand in such an unfinished and incomplete condition that no report could be made which would be at all satisfactory to those who had subscribed to the funds of the survey.

This was in the spring of 1870. Mr. Nettleton, before leaving Pleasantville, placed all the accumulated papers of the survey in my hands, where they have remained to the present time. They were accompanied by the following brief report to the Committee, dated Pleasantville, April 1, 1870, and addressed to the Committee of the Topographical Survey:

GENTLEMEN:—I herewith present to you the facts and papers relating to the survey which I commenced over one year since.

Levels have been carried to nearly all the important producing centres of the upper district; but I have not been able to connect Parker's Landing with the survey in consequence of its distance from my nearest "bench" at Venango City. I expected to have obtained the elevations along the Allegheny Valley Railway from its Chief Engineer, but have been disappointed.

Many difficulties have been encountered in getting information from well owners on whom I am entirely dependent for the data so essential to this work. Some are not willing and prompt in assisting in this way because they are under the impression that it is a private enterprise; but the most serious obstacle met with is the characteristic indifference of the people in the oil business to anything but that which promises an immediate personal benefit.

By means of the levels taken to the well mouths I have adjusted the records of one hundred and thirty-four wells in such a way that they all may be compared with one point. This point is the Ennis Well, Pleasantville, which is located on the highest ground in the county. All the other wells are therefore below this base. The elevation of this point above tide I at first determined from information furnished me by the Smithsonian Institution to be 1,761.81 feet. This result was arrived at by correcting my own levels with the levels of the Allegheny Valley Railway as I received them. But upon checking my line with other Railway Surveys, I find an error of about fifty-three feet, which I have traced to the Allegheny Valley Railway between Venango City and Pittsburg. This makes my base 1,709 feet above tide instead of 1,762, as first announced.*

In the arrangement of the strata of sandstone I have paid but little attention to the usual method of numbering, which, from the way of counting from the top is very liable to confuse; for in some places two or three mountain sands are found, and in others the first sand is the oil producing rock. I have discarded some records which were evidently incorrect, and have been forced to use some which are not altogether to be relied upon.

I have noted the elevation of 308 wells and about 80 permanent benches in different localities. I also give you the elevation above sea of several places in the western part of the state.

---

*The true elevation of this point as recently established by the Geological Survey is 1726′ (seventeen hundred and twenty-six feet) above ocean.

There have been sent out 158 blanks which have not been returned.

I have great confidence in this method of locating and defining the oil-bearing rocks, and from the data which I hand you very much can be gathered which is of practical use.

In the early part of my observations on this Survey I formed the opinion that the oil rocks dipped uniformly in one direction; but more extended surveys show differently. In some places the line of greatest dip is nearly south, while in others it is more westerly. The line of oil deposit lies almost invariably in the line of greatest dip, showing doubtless that the formation was made in swift running water, and the deposit of pebbles was in the line of the current. Hence, the "belts," which correspond with the dip.*

If, in your opinion, this survey is of any practical benefit, I would suggest that it be put into the hands of the Producers' Association, with a view of making it to the interest of a larger number to assist in collecting the necessary data.

Much more work is yet required to define and locate the oil-bearing rocks in this section of the State; but the difficulties above mentioned, and the lack of co-operation, together with demands on my own time which make it impossible for me to give it the attention required, have induced me to make this report and place in your hands to use as you may deem best all the facts and figures thus far collected.

No part of the result has been made public except a small sketch furnished to Dr. J. S. Newberry, of the Ohio State Geological Survey.

All of which is respectfully submitted.

E. S. Nettleton, C. E,

Since my connection with the Second Geological Survey of Pennsylvania I have found these papers of great service and been obliged to refer to them often for facts which could not now be otherwise obtained, but I did not feel at liberty to use the materials in any public way without Mr. Nettleton's consent and the acquiescence of the State Geologist. These restrictions are now removed by Mr. Nettleton's permission to publish whatever may be of general interest.

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*This early generalization by Mr. Nettleton cannot now be widely applied. [Ed.]

The well records are many of them imperfect; none of them indeed are just what the geologist requires, for they give no indication of the character of the strata between the sandstones. The blanks were not prepared with a view of studying the lithology further than it was involved in an examination of the oil rocks. But they accomplished the purpose intended, and brought out the facts required to demonstrate that there are different beds of sandstone lying at different horizons and all dipping with considerable uniformity to the south-west.

This may be shown in a general way by taking a few wells at random along the line surveyed from Pleasantville to Oil City, thus: (refer to the records)

(1)	Ennis Well, Pleasantville, top of oil sand above ocean		813*	feet.
(87)	National, No. 2, 1½ miles south-west of Pleasantville		785	"
(127)	Fink, No. 12, Shamburg	True 3d Sand.	730	"
(231)	Porter, Foster Farm, Oil Creek		684	"
(213)	G. K. Anderson, No. 134, Pet. Centre,		637	"
(258)	Lady Suffolk, Blood Farm		594	"
(261)	Well No. 23, Rynd Farm		574	"
(268)	Champion, No. 2, Rouseville		563	"
(269)	Elizabeth, Clapp Farm		551	"
(270)	Sivelly & Gardner, Allegheny Run		528	"

Between the National well and Fink, No. 12, there is a drop of about 45 feet in the figures here given from the *black oil* rock or Stray, to the *green oil* rock or Third sand of Oil Creek, which accounts for what appears to be a greater dip according to the distance than on other parts of the line. The Green oil rock is found under the Pleasantville district in its proper horizon, as is shown by some of the well records, but is unproductive. Between the National and Shamburg both rocks yield oil in some wells. To make the whole series of ocean elevations above given uniform—that is, all referring to the top of the third sand—the elevation at the National should be about 740 feet and at Ennis' about 768 feet.

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*All the figures in the final columns of the first publication in the Proc. A. P. S. have been raised 6 feet (807+6=813, &c.) since May 1, 1877, when the *datum level above ocean* of Oil City Union Depot RR. grade was finally fixed, by the Surveys of 1876-1877, at 1,006'.

Without doubt the general reader will be much confused in attempting to trace the oil sands in their proper order through the mass of records here given. No effort has been made to harmonize the apparent discrepancies made by drillers in numbering sand rocks. The records have been copied from the originals just as they were received, only making them to conform to the general plan adopted in the publication of the whole mass of records, good, bad and indifferent, which we have on hand. It will be a work for future study to select those which are reliable, and to arrange and classify them in an intelligible manner. We hope that the publication of these records as they are given to us by men who claim to understand the order and arrangement of the oil rocks will satisfy them that they are not working understandingly, and show them the necessity of a closer examination of the measures drilled through, and of a more careful numbering and measurement of the sand rocks.

Mr. Nettleton's levels, as mentioned in his report, were all based on his Ennis Hill datum. In 1874 we established the height of this hill by levels connecting with the railways at Tidioute, Tionesta and Rouseville as 1,713 feet above tide.* We now add 13 feet to reduce this to ocean level,† making it 1,726 feet above the ocean. The elevations of the following wells have all been adjusted to this standard.

All the wells not otherwise noted are located in Venango county, Pennsylvania.

Some of the records here given from Enterprise and the Columbia farm, on Oil creek, have been published in a previous issue.‡ It will be noted that these differ from the former quite materially—a circumstance which shows how unreliable, for close study, the best of records are, even when obtained from the well owners and superintendents themselves.

To make sure always that the well record sent in should be the particular one required, Mr. Nettleton adopted the plan of numbering the wells in his field book as he leveled to them.

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*At Schuylkill bridge, Philadelphia, Pennsylvania railroad datum.

†In Raritan Bay, Coast Survey datum. [Note.—In the first publication these elevations were provisionally given at 1713′ and 1720′.—Ed.]

‡Proc. Am. Phil. Soc. Dec., 1876.

He also carried with him a paint-pot and brush and marked the same number used in his note-book plainly on the samson-post. This is the "engineer's number" referred to in the blanks. When the well owner returned the record he gave, in addition to the name of the well, the number on the samson-post, and thus there could be no mistake made in adjusting the levels to the records. These numbers are given in the following pages at the end of the name of the well, in brackets, thus: Ennis Well (1), Harmonial Well No. 1 (53), &c., &c.

GROUP I.

Wells in the Borough of Pleasantville and adjoining its east line.

1. *Ennis Well.* (1)

October, 14, 1868.

On lease No. 3, Guild & Wright tract, adjoining east line of borough of Pleasantville. Authority, J. L. Ennis.

Well mouth above ocean (high tide) in feet					1726
? (Interval unknown)	446	to	446	=	1280
1st SS. (First Sandrock)	56	"	502	=	1224
?	168	"	670	=	1056
2d SS	40	"	710	=	1016
?	99	"	809	=	917
3d SS	30	"	839	=	887
?	74	"	913	=	813
4th SS	22	"	935	=	791

Wet hole. Cased at 446′. Pumped 4 feet from the bottom. Best production, 200 barrels per day. Gas sufficient to fire 6 boilers. Black oil; gravity, 43°.

2. *Swan and Belch Well, No.* 1. (57)

January 26, 1869.

S. M. Dunham farm, lease No. 5, Canfield tract, adjoining east line of borough of Pleasantville, Authority, Edwin Swan.

Well mouth above ocean in feet					1684
?	180	to	180	=	1504
1st SS	15	"	195	=	1489
?	422	"	617	=	1067
2d SS	24	"	641	=	1043
?	79	"	720	=	964
Stray SS	25	"	745	=	939

?	15	to	760	=	924
3d SS	28	"	788	=	896
?	72	"	860	=	824
4th SS pebble and rock,	9	"	869	=	815
? pocket,	23¼	"	892¼	=	791¾

Wet hole. Cased at 407′. Pumped 12 feet from bottom.

Best production, 130 barrels per day. Gas sufficient to fire 3 boilers. Black oil. Mud veins at 775′ and 862′.

3. *Bonta and Hawes Well, No. 5.* (60)

December, 1868.

Lease No. 4, Geroe farm, adjoining east line of borough of Pleasantville. Authority, Charles P. Byron.

Well mouth above ocean in feet					1654
? (Interval unknown)	215	to	215	=	1439
1st SS. (First Sandstone)	12	"	227	=	1427
?	205	"	432	=	1222
2d SS	22	"	454	=	1200
?	203	"	657	=	997
3d SS	50	"	707	=	947
?	135	"	842	=	812
4th SS pebble,	16	"	858	=	796
? pocket,	2	"	860	=	794

Wet hole. Cased at 280′. Pumped 1½ feet from bottom.

Best production, 120 barrels per day. Gas sufficient to fire 3 boilers. Black oil. Mud veins at 666′ and 852′.

4. *M'Grew and Ritchie Well.* (5)

February, 1869.

Jack farm, M'Grew, Ritchie & Co.'s tract, adjoining north-east corner of borough of Pleasantville. Authority, James B. M'Clune.

Well mouth above ocean in feet					1690
?	135	to	135	=	1555
1st SS	85	"	220	=	1470
?	197	"	417	=	1273
2d SS	18	"	435	=	1255
?	194	"	629	=	1061
3d SS	24	"	653	=	1037
?	122	"	775	=	915
4th SS	35	"	810	=	880
?	67	"	877	=	813
5th SS pebble,	11	"	888	=	802
? pocket,	8	"	896	=	794

Wet hole. Cased at 425′.

Black oil.

5. *Jack Well.* (7)

February, 1869.

Jack farm, adjoining the north-east corner of borough of Pleasantville. Authority, George H. Jack.

Well mouth above ocean in feet					1686
? (Interval unknown)	402	to	402	=	1284
1st SS. (First Sandstone)	18	"	420	=	1266
?	230	"	650	=	1036
2d SS	10	"	660	=	1026
?	65	"	725	=	961
3d SS	30	"	755	=	931
?	116	"	871	=	815
4th SS	11	"	882	=	804
? pocket.	7	"	889	=	797

Wet hole. Cased at 405′.

Best production, 12 barrels per day. Gas sufficient to fire one boiler.

6. *Rising Sun Well.* (8)

February, 1869.

Jack Farm, adjoining north-east corner of borough of Pleasantville. Authority, Wm. A. Barnes.

Well mouth above ocean in feet					1682
?	390	to	390	=	1292
1st SS	28	"	418	=	1264
?	215	"	633	=	1049
2d SS	20	"	653	=	1029
?	112	"	765	=	917
3d SS	33	"	798	=	884
?	73	"	871	=	811
4th SS	11	"	882	=	800
? pocket,	5	"	887	=	795

Wet hole. Cased at 397′. Black oil.

Best production per day, 10 barrels. Gas sufficient to fire one boiler.

7. *Howe Well.* (11)

March, 1869.

Jack Farm, adjoining north-east corner of borough of Pleasantville. Authority, ——.

Well mouth above ocean in feet					1677
?	400	to	400	=	1277
2d SS	30	"	430	=	1247
? including 3d SS	432	"	862	=	815
4th SS	18	"	880	=	797
? pocket,	6	"	886	=	791

Wet hole. Cased at 415′.

Best production, 20 barrels per day. Gas sufficient to fire one boiler.

8. *Nettleton Well, No.* 1. (20)

January 17, 1866.

Nettleton tract, formerly Watkins farm, lease No. 2, northeast corner of borough of Pleasantville. Authority, E. S. Nettleton.

Well mouth above ocean in feet						1588
? (Interval unknown)		109	to	109	=	1479
1st SS. (First Sandstone)		121	"	230	=	1358
?		72	"	302	=	1286
2d SS		46	"	348	=	1240
?		137	"	485	=	1103
Red Rock [redacted]		55	"	540	=	1048
3d SS		17	"	557	=	1031
?		170	"	727	=	861
4th SS		9	"	736	=	852
?		126	"	862	=	726
5th SS	pebble and sand,	18	"	880	=	708
?	pocket,	11½	"	891½	=	696½

Wet hole. Cased at 180′. Pumped at 22′ from bottom.

Best production, 35 barrels per day. Gas sufficient to fire 4 boilers. Black oil. Gravity, 44°. Mud veins at 557′ and 730′. The lowest water course is at 162′. At 716′ a quartz vein was struck. Well was tested thoroughly at 736′ and 560′. At the 736′ test, considerable gas was found.

9. *Richey Well, No.* 1. (15)

December, 1868.

Nettleton Farm, lease 15, borough of Pleasantville. Authority, John Nichols.

Well mouth above ocean level						1657
?		8	to	8	=	1649
1st SS		43	"	51	=	1606
?		330	"	381	=	1276
2d SS		34	"	415	=	1242
?		285	"	700	=	957
3d SS		32	"	732	=	925
?		113	"	845	=	812
4th SS	pebble and sand,	17	"	862	=	795

Wet hole. Cased at 384′. Pumped 5′ feet from the bottom.

Best production per day, 35 barrels. Gas sufficient to fire 2 boilers. Dark green oil. Gravity, 43° to 48°.

10. *Plumer Well, No.* 1. (16)

April, 1869.

Nettleton Farm, borough of Pleasantville. Authority, ——.

Well mouth above ocean in feet					1645
? (Interval unknown)	828	to	828	=	817
4th SS. (Fourth Sandstone)	20	"	848	=	797
? pocket,	2	"	850	=	795

11. *Lippincott Well, No.* 1. (18)

February, 1869.

Watkins' Farm, lease, 17, borough of Pleasantville, 50 rods south of Nettleton's well. Authority, ——.

Well mouth above ocean					1625
?	340	to	340	=	1285
2d SS	8	"	348	=	1277
?	232	"	580	=	1045
3d SS	35	"	615	=	1010
?	25	"	640	=	985
4th SS	25	"	665	=	960
?	30	"	695	=	930
5th SS	20	"	715	=	910
?	99	"	814	=	811
6th SS	18	"	832	=	793
? pocket,	8	"	840	=	785

Wet hole. Cased at 341′.

Best production, 3 barrels per day. Gas sufficient to fire two boilers. Black oil. Mud vein at 700′.

12. *Blakesley Well.* (14)

November, 1868.

Brown and House farm, situated in the borough of Pleasantville. Authority, ——.

Well mouth above ocean in feet					1678
?	400	to	400	=	1278
2d SS. estimated	25	"	425	=	1253
?	200	"	625	=	1053
3d SS. estimated	15	"	640	=	1038
?	70	"	710	=	968
Stray SS	15	"	725	=	953
?	40	"	765	=	913
4th SS	40	"	805	=	873
?	56	"	861	=	817
5th SS	19	"	880	=	798

Wet hole. Cased at 415′.

Best production, 10 barrels per day. Gas sufficient to fire one boiler. Black oil.

13. *United States Petroleum Co.'s Well, No.* 27. (23)

October 2, 1868.

Brown and House tract, borough of Pleasantville. Authority Wm. H. Kerns.

Well mouth above ocean in feet					1682
? (Interval unknown)	392	to	392	=	1290
1st SS. (First Sandstone)	23	"	415	=	1267
?	206	"	621	=	1061
2d SS	40	"	661	=	1021
?	112	"	773	=	909
3d SS	25	"	798	=	884
?	74	"	872	=	810
4th SS, sand,	15	"	887	=	795
? pocket,	7	"	894	=	788

Wet hole. Cased at 631′.

Best production, 60 barrels per day. Gas sufficient to fire three boilers. Black oil.

14. *Harsh Well, No.* 3. (28)

October 20, 1868.

Harsh tract, lease No. 3, borough of Pleasantville. Authority, Samuel Harsh.

Well mouth above ocean in feet					1688
?	30	to	30	=	1658
1st SS	40	"	70	=	1618
?	66	"	136	=	1552
2d SS. estimated	20	"	156	=	1532
?	609	"	765	=	923
3d SS. estimated	30	"	795	=	893
?	77	"	872	=	816
4th SS, pebble and sand,	15	"	887	=	801
? pocket,	7½	"	894½	=	793½

Wet hole. Cased at 450′. Pumped 9′ from bottom.

Best production, 70 barrels per day. Gas sufficient to fire 2½ boilers. Black oil.

Struck a water course at 140′ from the surface. A dry crevice struck at 250′ from the surface, carried off the water coming in at 140′.

15. *Schreiber Well, No.* 1. (29)

October 28, 1868.

Harsh tract, lease No. 1, borough of Pleasantville. Authority, Albert Insinger, Jr.

Well mouth above ocean in feet					1680
?	20	to	20	=	1660
1st SS	45	"	65	=	1615

?	545	to	610	=	1070
2d SS	32	"	642	=	1038
?	103	"	745	=	935
3d SS	30	"	775	=	905
?	97	"	872	=	808
4th SS.... 4 feet at top pebble; bottom sand,	20	"	892	=	788
? pocket,	1	"	893	=	787

Wet hole. Cased at 615′. Pumped at 8 feet from the bottom.

Best production, 30 barrels per day. Gas sufficient to fire one boiler. Black oil. Mud veins at 760′ and 877′ from surface.

16. *Tidioute Well, No.* 1. (30)

October, 1868.

Connely farm, borough of Pleasantville. Authority, ——.

Well mouth above ocean in feet					1676
? (Interval unknown)	410	to	410	=	1266
1st SS. (First Sandstone)	30	"	440	=	1236
?	193	"	633	=	1043
2d SS	20	"	653	=	1023
?	102	"	755	=	921
3d SS	30	"	785	=	891
?	82	"	867	=	809
4th SS	17	"	884	=	792

Wet hole. Cased at 428′.

Best production, 135 barrels per day. Gas sufficient to fire 2 boilers.

17. *Crocker Well.* (31)

October, 1869.

Connely tract, borough of Pleasantville. Authority, ——.

Well mouth above ocean in feet					1681
?	408	to	408	=	1273
1st SS	18	"	426	=	1255
?	440	"	866	=	815
4th SS	20	"	886	=	795

Wet hole. Cased at 412′.

Best production, 26 barrels per day. Gas sufficient to fire 1½ boilers. Black oil.

18. *Beam Well, No.* 1. (37)

June 25, 1868.

On land bought of T. B. Shugart, M. D., in borough of Pleasantville. Authority, Beam Bros.

Well mouth above ocean in feet					1652
?	100	to	100	=	1552

1st SS.	12	to	112	=	1540
?	258	“	370	=	1282
2d SS	15	“	385	=	1267
?	212	“	597	=	1055
3d SS	28	“	625	=	1027
?	111	“	736	=	916
4th SS	35	“	771	=	881
?	69	“	840	=	812
5th SS... yellow; pebble at top and middle,	17	“	857	=	795
? pocket,	1	“	858	=	794

Wet hole. Cased at 609′. Pumped 3½ feet from bottom.

Best production, 68 barrels per day. Gas sufficient to fire 18 boilers. Black oil. Mud veins at 746′ and 848′.

The sand rocks were all measured when struck and when through, with the exception of the First or Mountain sand, which was calculated by the length of the tools standing in the derrick and by the rope to the wrapper. Average production to January, 1869—6 months and 5 days—30 barrels per day. Tubing drawn only twice, and only four days stoppage altogether during that period. Production at January 1, 1869, 7 barrels per day.

19. *Say Well, No.* 6. (42)

November 26, 1868.

Zuver farm, borough of Pleasantville. Authority, Williams, Say & Co.

Well mouth above ocean in feet					1638
? (Interval unknown)	207	to	207	=	1431
1st SS. (First Sandstone)	92	“	299	=	1339
?	141	“	440	=	1198
2d SS	20	“	460	=	1178
?	225	“	685	=	953
3d SS	22	“	707	=	931
?	106	“	813	=	825
4th SS	40	“	853	=	785
?	65	“	918	=	720
5th SS pebble,	18	“	936	=	702

Wet hole. Cased at 362′. Pumped 6 feet from bottom.

Best production, 15 barrels per day. Gas sufficient to fire 2 boilers. Black oil.

20. *Say Well, No.* 5. (43)

September 29, 1868.

Zuver farm, lease No. 1, borough of Pleasantville. Authority, Williams, Say & Co.

Well mouth above ocean in feet					1629
?	110	to	110	=	1519

1st SS	92	to	202	=	1427
?	141	"	343	=	1286
2d SS	20	"	363	=	1266
?	225	"	588	=	1041
3d SS	22	"	610	=	1019
?	114	"	724	=	905
4th SS	60	"	784	=	845
?	36	"	820	=	809
5th SS, pebble,	14	"	834	=	795

Wet hole. Cased at 356′. Pumped 5 feet from bottom.

Best production, 90 barrels per day. Gas suffcient to fire 4 boilers. Black oil. Gravity, 49°.

Too many holes drilled in the immediate vicinity for the good health of this well.

21. *Say Well, No.* 2. (54)

June 15, 1868.

Zuver farm, lease No. 2, borough of Pleasantville. Authority, Williams, Say & Co.

Well mouth above ocean in feet					1624
? (Interval unknown)	100	to	100	=	1524
1st SS (First Sandstone)	90	"	190	=	1434
?	147	"	337	=	1287
2d SS	20	"	357	=	1267
?	223	"	580	=	1044
3d SS	25	"	605	=	1019
?	115	"	720	=	904
4th SS	60	"	780	=	844
?	38	"	818	=	806
5th SS	17	"	835	=	789

Wet hole. Cased at 355′. Pumped 3′ from bottom.

Best production, 80 barrels per day. Gas sufficient to fire 15 boilers. Black oil.

22. *Benedict Well.* (280)

February, 1869.

On Joseph Benedict's lot, borough of Pleasantville. Authority, C. L. Raver & Co.

Well mouth above ocean in feet					1640
?	390	to	390	=	1250
1st SS	15	"	405	=	1235
?	197	"	602	=	1038
2d SS	25	"	627	=	1013
?	103	"	730	=	910
3d SS	40	"	770	=	870
?	62	"	832	=	808
4th SS	18	"	850	=	790
?, pocket,	5	"	855	=	785

Wet hole. Cased at 390′. Gas sufficient to fire one boiler. Best production, 3 barrels per day.

23. *Porter and Taylor Well, No.* 1. (49)

November 17, 1868.

Wm Porter farm, borough of Pleasantville. Authority, Stephen Hine.

Well mouth above ocean in feet						1623
? (Interval unknown)		350	to	350	=	1273
1st SS. (First Sandstone)		25	"	375	=	1248
?		210	"	585	=	1038
2d SS		40	"	625	=	998
?		90	"	715	=	908
3d SS		40	"	755	=	868
?		51	"	806	=	817
4th SS	fine pebble,	19	"	825	=	798
?	pocket,	4½	"	829½	=	793½

Wet hole. Cased at 355′. Pumped 6 feet from bottom.

Best production per day, 14 barrels. Gas sufficient to fire one boiler. Black oil.

24. *Harmonial Well, No.* 1. (53)

February 1, 1868.

Wm. Porter farm, borough of Pleasantville. Authority, Norman Potter, agent.

Well mouth above ocean in feet						1620
?		70	to	70	=	1550
1st SS		12	"	82	=	1538
?		494	"	576	=	1044
2d SS		40	"	616	=	1004
?		91	"	707	=	913
3d SS		40	"	747	=	873
?		65	"	812	=	808
4th SS	15′ pebble, 3′ sand,	18	"	830	=	790
Slate	pocket,	5	"	835	=	785

Wet hole. Cased at 312′. Pumped 9 feet from bottom.

Best production, 125 barrels per day. Gas sufficient to fire 3 to 4 boilers. Black oil. Gravity, 47°. Mud veins in 2d, 3d and 4th sands.

Well was cased first at 380′; flowed 3 months, averaging 100 barrels per day, but running down, it finally ceased yielding oil in paying quantities November 1, 1868. It was then drilled deeper, showing the following record:

Thickness of measures to bottom of 4th SS..		830	to	830	=	790
Slate		24	"	854	=	766
5th SS		20	"	874	=	746
?	pocket,	6	"	880	=	740

The 5th or "green oil sand" was fine, gray and muddy. It furnished a good supply of gas and some green oil, but not in sufficient quantity to pay the expenses of pumping the well.

25. *Comey and Andrews Well. No.* 1. (113)

November 9, 1868.

Lease No. 11, west part of Porter farm, now Brown, Byers & Co., borough of Pleasantville. Authority, Gaylord Mattison.

Well mouth above ocean in feet						1587
? (Interval unknown)		100	to	100	=	1487
1st SS (First Sandstone)		140	"	240	=	1347
?		75	"	315	=	1272
2d SS		25	"	340	=	1247
?		80	"	420	=	1167
3d SS		30	"	450	=	1137
?		230	"	680	=	907
4th SS		20	"	700	=	887
?		95	"	795	=	792
5th SS	pebble,	18	"	813	=	774
?	pocket,	7	"	820	=	767

Wet hole. Cased at 320′. Pumped 9′ from the bottom.

Best production, 3 barrels per day. Gas sufficient to fire one-half boiler.* Black oil. Gravity, 45°.

26. *M'Grew Well, No.* 1. (70)

1868.

Brown Brothers farm, borough of Pleasantville. Authority, James M'Grew.

Well mouth above ocean in feet						1641
?		12	to	12	=	1629
1st SS		26	"	38	=	1603
?		338	"	376	=	1265
2d SS		12	"	388	=	1253
?		208	"	596	=	1045
3d SS		43	"	639	=	1002
?		99	"	738	=	903
4th SS		27	"	765	=	876
?		70	"	835	=	806
5th SS		18	"	853	=	788
?	pocket,	2	"	855	=	786

Wet hole. Cased at 382′. Black oil. Mud veins in 4th and 5th SS.'s.

The numbers given to the sands are not the proper ones, as the mountain sand should not be counted. We pumped the well at several points in the sand marked 5th SS. as above. I do not recall how many feet of pebble sand there were.

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*i. e. Not enough gas to fire one boiler.

27. *Harmonial Well, No.* 2. (95)

July 1, 1868.

Armstrong farm, lease No. 40, three-quarters of a mile nearly south from Pleasantville Corners. Authority, Norman Potter, agent.

Well mouth above ocean in feet					1647
? (Interval unknown)	36	to	36	=	1611
1st SS. (First Sandstone)	60	"	96	=	1551
?	294	"	390	=	1257
2d SS estimated,	20	"	410	=	1237
?	350	"	760	=	887
3d SS	25	"	785	=	862
?	55	"	840	=	807
4th SS sand and pebble,	16	"	856	=	791
? pocket,	14	"	870	=	777

Wet hole. Cased at 395′. Pumped 14 feet from bottom.

Best production, 80 barrels per day. Gas sufficient to fire 2 boilers. Black oil. Gravity, 45°.

The three upper rocks were very much broken up. Production at this date (December 19, 1868,) 10 barrels per day.

GROUP II.

Wells in the vicinity of Pleasantville.

28. *Baldwin and Porter Well, No.* 1. (238)

February, 1869.

On Gates farm, Neilltown road, three-quarters of a mile north-east of the borough of Pleasantville. Authority, James B. M'Clune.

Well mouth above ocean in feet					1622
?	110	to	110	=	1512
1st SS	90	"	200	=	1422
?	140	"	340	=	1282
2d SS	31	"	371	=	1251
?	203	"	574	=	1048
3d SS	21	"	595	=	1027
?	117	"	712	=	910
4th SS	36	"	748	=	874
?	70	"	818	=	804
5th SS	12	"	830	=	792
?	27	"	857	=	765
6th SS.. top white pebble, bottom gray sand,	20	"	877	=	745
? pocket,	10	"	887	=	735

Wet hole. Cased at 353′. Gas sufficient to fire 8 boilers.

This well was tested at 840′, in the "black oil sand," and afterwards drilled to 887′. The flow of gas came from the lower or "green oil sand." But little oil in either of the sands.

29. *Norman Potter Well.* (308)

January 1, 1870.

On Aaron Gates' farm, one mile north-east of Pleasantville. Authority?

Well mouth above ocean in feet					**1518**
? (Interval unknown)	**225**	**to**	**225**	**=**	**1293**
1st SS. (First Sandstone)	**20**	**"**	**245**	**=**	**1273**
?	**215**	**"**	**460**	**=**	**1058**
2d SS	**28**	**"**	**488**	**=**	**1030**
?	**112**	**"**	**600**	**=**	**918**
3d SS	**22**	**"**	**622**	**=**	**896**
? 703′ to 707′, pebbly,	**109**	**"**	**731**	**=**	**787**
4th SS. 5′ pebble. 16′ gray sand,	**21**	**"**	**752**	**=**	**766**
? pocket,	**7**	**"**	**759**	**=**	**759**

This well at the present time is pumping about 20 barrels of salt water per day. (Jan. 4, 1870.)

30. *Mason Well.* (277)

1865 and 1868.

On Prosser farm, about 1½ miles north 80° east of Pleasantville. Authority, Jas. B. McClune.

Well mouth above ocean in feet					**1557**
?	**90**	**to**	**90**	**=**	**1467**
1st SS	**68**	**"**	**158**	**=**	**1399**
?	**94**	**"**	**252**	**=**	**1305**
2d SS	**18**	**"**	**270**	**=**	**1287**
?	**228**	**"**	**498**	**=**	**1059**
3d SS	**13**	**"**	**511**	**=**	**1046**
?	**69**	**"**	**580**	**=**	**977**
4th SS	**20**	**"**	**600**	**=**	**957**
?	**30**	**"**	**630**	**=**	**927**
5th SS	**28**	**"**	**658**	**=**	**899**
?	**134**	**"**	**792**	**=**	**765**
6th SS	**10**	**"**	**802**	**=**	**755**
? pocket,	**3**	**"**	**805**	**=**	**752**

Wet hole. Cased at 260′. Green oil show.

Mud veins at 582′ and 634′.

31. *Fobes Well.* (278)

Fall of 1865.

Dunham farm, 1½ miles east of Pleasantville. Authority, George C. Fobes.

Well mouth above ocean in feet					1527
? (Interval unknown)	85	to	85	=	1442
1st SS. (First Sandstone)	55	"	140	=	1387
?	79	"	219	=	1308
2d SS	34	"	253	=	1274
?	284	"	537	=	990
3d SS	31	"	568	=	959
?	35	"	603	=	924
4th SS	28	"	631	=	896
?	86	"	717	=	810
5th SS	2	"	719	=	808
?	15	"	734	=	793
6th SS	11	"	745	=	782
?	96	"	841	=	686
Sand, shales and pebbles	24	"	865	=	662
?	11	"	876	=	651
Red rock	57	"	933	=	594
Slate	107	"	1040	=	487
Red rock	10	"	1050	=	477

Wet hole. Cased at —. Mud veins at 507′ and 597′.

This well was tested at 650′, and then drilled to its present depth and tested again, with but little show of oil at either point.

32. *Steele Well, No.* 1. (120)

November, 1868.

Benj. Tyrrell farm, 1¼ miles south-east of Pleasantville, near Ledsham well. Authority, ———.

Well mouth above ocean in feet					1572
?	620	to	620	=	952
3d SS	37	"	657	=	915
?	115	"	772	=	800
5th SS ... pebble,	17	"	789	=	783
? ... pocket,	7	"	796	=	776

Wet hole. Cased at 318′. Pumped 24 feet from bottom. Best production, 8 barrels per day. Black oil.

33. *Ledsham Well, No.* 1. (121)

November, 1866.

S. Q. Brown and Porter (or B. Tyrell) farm, 1¼ miles south-east of Pleasantville. Authority, Alfred Ledsham.

Well mouth above ocean in feet					1556
?	97	to	97	=	1459

1st SS		18	to	115	=	1441
?		141	"	256	=	1300
2d SS		58	"	314	=	1242
?		170	"	484	=	1072
3d SS		41	"	525	=	1031
?		58	"	583	=	973
4th SS		73	"	656	=	900
?		74	"	730	=	826
5th SS	brown coarse pebble,	13	"	743	=	813
?		27	"	770	=	786
6th SS	pebble,	20	"	790	=	766
?	pocket,	28	"	818	=	738

Wet hole. Cased at 300′. Pumped 15′ from bottom.

Best production, 16 barrels per day. Half enough gas to fire 1 boiler. Black oil. Gravity, 44°.

The 4th SS. consists of two layers with a small stratum of slate intervening about the middle (say 10′ of slate). The 5th SS. is of uniform texture throughout. The 6th SS. is white, and finer than the 5th SS.

34. *Terry Well.* (125)

Bean farm, 2¾ miles south-east of Pleasantville, near Farmers' hotel. Authority, ——.

Well mouth above ocean in feet						1493
? (Interval unknown)		203	to	203	=	1290
1st SS. (First Sandstone)		28	"	231	=	1262
?		196	"	427	=	1066
2d SS		26	"	453	=	1040
?		72	"	525	=	968
3d SS		20	"	545	=	948
?		25	"	570	=	923
4th SS		18	"	588	=	905
?		90	"	678	=	815
5th SS		14	"	692	=	801
?	pocket,	1	"	693	=	800

Wet hole. Black oil.

Wells have been put down deeper in the vicinity of this well which find 27′ of slate between the two lower sands, the 5th and 6th.

35. *Golden Well, No.* 2. (165)

February, 1868.

Pithole Golden and Cherry Run Petroleum Company's Golden farm, 2 miles south of Pleasantville. Authority, John F. Carll.

Well mouth above ocean in feet					1557
?	72	to	72	=	1485

1st SS	75	to	147	=	1410
?	151	"	298	=	1259
2d SS	17	"	315	=	1242
?	131	"	446	=	1111
3d SS	11	"	457	=	1100
?	79	"	536	=	1021
4th SS	19	"	555	=	1002
?	61	"	616	=	941
5th SS	21	"	637	=	920
?	32	"	669	=	888
6th SS	21	"	690	=	867
?	79	"	769	=	788
7th SS ... pebble and sand,	15	"	784	=	773
? ... pocket,	1	"	785	=	772

Wet hole. Cased at 300′. Pumped 2′ from bottom.

Best production, 7 barrels per day. Half enough gas to fire a boiler. Black oil. Gravity, 47°. Mud veins at 678′ and 777′.

36. *North Star Well, No.* 2. (163)

January 9, 1869.

Lease No. 1, North Star Company's "Clark farm," 1½ miles south of Pleasantville. Authority, T. Chattle.

Well mouth above ocean in feet					1617
? (Interval unknown)	153	to	153	=	1464
1st SS. (First Sandstone)	20	"	173	=	1444
?	172	"	345	=	1272
2d SS	25	"	370	=	1247
?	260	"	630	=	987
3d SS	62	"	692	=	925
?	23	"	715	=	902
4th SS	35	"	750	=	867
?	65	"	815	=	802
5th SS	12	"	827	=	790

Wet hole. Cased at 347′. Pumped 3′ 6″ from bottom.

Best production, 35 barrels per day. Gas sufficient to fire 1' boiler. Dark oil. Mud veins at 740′ and 822′.

37. *Hoozier Well.* (287)

1865.

At Dawson Centre, Pithole creek, 1½ miles above Pithole City, and 4 miles south of Pleasantville. Authority, Norman R. Bates.

Well mouth above ocean in feet					1363
?	124	to	124	=	1239
1st SS	24	"	148	=	1215

?	209	to	357	=	1006
2d SS	24	"	381	=	982
?	76	"	457	=	906
3d SS	30	"	487	=	876
?	103	"	590	=	773
4th SS	20	"	610	=	753
? pocket,	33	"	643	=	720

Best production, 15 barrels per day. Green oil.

38. *Skidmore Well.* (293)

April, 1869.

M'Bride farm, "Tip-Top," 2½ miles south of Pleasantville. Authority ?

Well mouth above ocean in feet					1628
? (Interval unknown)	787	to	787	=	841
4th SS. (Fourth Sandstone)	25	"	812	=	816
?	63	"	875	=	753
5th SS	22	"	897	=	731
? pocket,	3	"	900	=	728

Wet hole. Cased at 420′.

Best production, 35 barrels per day. Half enough gas to fire a boiler. Black oil.

This well is supposed to be pumping from the same as the 4th rock in Pleasantville, but the oil is of lighter color.

39. *Black Well.* (292)

Lease No. 25, Winslow Petroleum Co., "Tip-Top," 2½ miles south of Pleasantville. Authority, Mr. Loud, superintendent.

Well mouth above ocean in feet					1536
?	118	to	118	=	1418
1st SS	65	"	183	=	1353
?	123	"	306	=	1230
2d SS	34	"	340	=	1196
?	200	"	540	=	996
3d SS	16	"	556	=	980
?	14	"	570	=	966
4th SS	26	"	596	=	940
?	37	"	633	=	903
5th SS	22	"	655	=	881
?	43	"	698	=	838
6th SS	25	"	723	=	813
?	67	"	790	=	746
7th SS pebble,	5	"	795	=	741
?	3	"	798	=	738
8th SS pebble,	6	"	804	=	732
? pocket,	10	"	814	=	722

Wet hole.

Best production, 1 barrel per day. Half enough gas to fire a boiler.

40. *Olive Well.* (182)

1865.

Hebert tract, Mill farm, 2¼ miles south of Pleasantville. Authority?

Well mouth above ocean in feet					1492
? (Interval unknown)	202	to	202	=	1290
1st SS. (First Sandstone)	38	"	240	=	1252
?	130	"	370	=	1122
2d SS	5	"	375	=	1117
?	155	"	530	=	962
3d SS	10	"	540	=	952
?	97	"	637	=	855
4th SS	21	"	658	=	834
?	77	"	735	=	757
5th SS	15	"	750	=	742
?	10	"	760	=	732
6th SS ... pebble and sand,	12	"	772	=	720
? ... pocket,	29	"	811	=	691

Wet hole. Not cased. Seed bag at 480′.

Black oil. Gravity, 45°.

41. *Buffalo Well, No.* 1. (181)

December 26, 1868.

Lease A, (10 acres,) Mill farm, 1¾ miles south of Pleasantville. Authority, Wm. Williams & S. Simpkins.

Well mouth above ocean in feet					1492
?	60	to	60	=	1432
1st SS	50	"	110	=	1382
?	150	"	260	=	1232
2d SS	25	"	285	=	1207
?	240	"	525	=	967
3d SS	15	"	540	=	952
?	50	"	590	=	902
4th SS	20	"	610	=	882
?	130	"	740	=	752
5th SS ... pebble and sand,	16	"	756	=	736

Wet hole. Cased at 535′. Pumped 7′ from bottom.

Best production, 4 barrels per day. Half enough gas to fire 1 boiler. Black oil. Gravity, 47°.

This well is supposed to be flooded by several old abandoned wells in the immediate vicinity. Have pumped in 27 days 42 barrels of roily oil, green and black, principally black.

42. *Snyder Well, No.* 1. (180)

December, 1868.

Lease No. 3, Mill farm, 1¾ miles south of Pleasantville. Authority, J. C. Champion.

Well mouth above ocean in feet					1516
? (Interval unknown)	50	to	50	=	1466
1st SS. (First Sandstone)	40	"	90	=	1426
?	165	"	255	=	1261
2d SS	25	"	280	=	1236
?	130	"	410	=	1106
3d SS	25	"	435	=	1081
?	70	"	505	=	1011
4th SS	20	"	525	=	991
?	70	"	595	=	921
5th SS	14	"	609	=	907
?	31	"	640	=	876
6th SS	20	"	660	=	856
?	80	"	740	=	776
7th SS	18	"	758	=	758
? pocket,	2	"	760	=	756

Wet hole. Cased at 275′. Pumped 8′ from bottom.

Best production, 90 barrels per day. Gas sufficient to fire 1 boiler. Black oil. Gravity, 48°. Mud veins in both the lower sands.

43. *Bates Well, No.* 1. (102)

————, 1866.

Dawson farm, 1⅓ miles south of Pleasantville. Authority, N. R. Bates.

Well mouth above ocean in feet					1593
?	560	to	560	=	1033
3d SS. estimated	30	"	590	=	1003
?	50	"	640	=	953
4th SS	30	"	670	=	923
?	122	"	792	=	801
5th SS fine pebble and sand,	13	"	805	=	788
? pocket,	15	"	820	=	773

Wet hole. Cased at 400′. Pumped 20′ from bottom.

Black oil. Gravity, 47°, when first pumped.

At one time during the first 90 days of the production the well yielded at the rate of 500 barrels per day, and was running at this rate when the men, in the excitement occasioned by so great a flow of oil, "shut down" to connect with a larger tank. This seemed to check the flow so effectually that the well could never be brought up to its former production.

The first part of the record was lost. My driller reported *lime* and sand for 30′ above the 5th SS. Overlying this was a stratum of *soapstone* more than 20′ thick, in which was a *crevice* or cavity 5′ in depth, then 3′ of soapstone, then a *cavity* of 11′ in depth, as measured by pole tools.*

44 *Bates Petroleum Co. Well, No.* 3. (119)

Fall and Winter of 1866.

Matteson farm, Pleasantville and Enterprise road, half a mile north of Pleasantville. Authority, N. R. Bates.

Well mouth above ocean in feet					1469
? (Interval unknown)	175	to	175	=	1294
1st SS. (First Sandstone)	40	"	215	=	1254
?	201	"	416	=	1053
2d SS	40	"	456	=	1013
?	105	"	561	=	908
3d SS	33	"	594	=	875
?	84	"	678	=	791
4th SS . . . inferior, gray,	12	"	690	=	779
?	10	"	700	=	769
5th SS . . . close, some pebbles,	20	"	720	=	749
? . . . pocket,	10	"	730	=	739

Wet hole. Cased at 190′.

Best production, half barrel per day. Gas sufficient to fire half boiler. Green oil.

When this well was first tested, after a few days of pumping, it showed very well, giving considerable gas and throwing at intervals a full pipe of oil. At this time an accident occurred, fastening the working valve so as to necessitate the drawing of the tubing. As the well was not cased at this time it seemed to be injured very much by the letting in of the water, and never again made so good a show as at first.

45. *Paschmacker Well.* (198)

1868.

Near school house on Pleasantville and Enterprise road, 1 mile north of Pleasantville. Authority, M. P. Barber.

Well mouth above ocean in feet					1592
?	306	to	306	=	1286
1st SS	21	"	327	=	1265

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*As these well records are here merely placed on record no comment is made on such extraordinary (or rather, ordinary) statements. The literature of oil is full of them. They are mostly based on errors of observation easily explained. [J. P. L.]

?		53	to	380	=	1212
2d SS.		26	"	406	=	1186
?		284	"	690	=	902
3d SS		20	"	710	=	882
?		110	"	820	=	772
4th SS.		21	"	841	=	751
?	pocket,	114	"	955	=	637

Wet hole.

Unproductive. Green oil show. Little gas. Red water.

46. *Eaton Well.* (289)

April, 1869.

On lease No. 1, J. Y. Siggins farm, 1 mile north-west of Pleasantville. Authority, James Y. Siggins.

Well mouth above ocean in feet						1674
? (Interval unknown)		140	to	140	=	1534
1st SS. (First Sandstone)		35	"	175	=	1499
?		45	"	220	=	1454
2d SS		50	"	270	=	1404
?		373	"	643	=	1031
3d SS		40	"	683	=	991
?		97	"	780	=	894
4th SS	pebble,	20	"	800	=	874
?		121	"	921	=	753
5th SS	sand,	12	"	933	=	741
?	pocket,	9	"	942	=	732

Wet hole. Cased at 450′. Mud veins at centre of 3d and 4th sands.

Best production, 2 gallons per day. Green oil.

About 10′ of the top of the 4th SS. was pebbly and ought to have produced oil, if immediately tested, but the well was drilled to the 5th sand before the tubing was put in. This sand was white and close, with no pebbles.

47. *Siggins Well.* (291)

November, 1868.

James Y. Siggins farm, 1 mile north-west of Pleasantville. Authority, James Y. Siggins.

Well mouth above ocean in feet					1541
?	95	to	95	=	1446
1st SS	40	"	135	=	1406
?	125	"	260	=	1281
2d SS	37	"	297	=	1244
?	219	"	516	=	1025
3d SS	42	"	558	=	983

?	103	to	661	=	880
4th SS	15	"	676	=	865
?	104	"	780	=	761
5th SS	19	"	799	=	742
?	81	"	880	=	661

Wet hole.

The 4th SS. was a splendid pebble rock with excellent show of oil. Got the sand pump stuck in drilling and had to drill it out, and this is thought to have spoiled the well.

48. *Smythe Well.* (118)

1869.

John M'Caslin farm, 1 mile west of Pleasantville. Authority, ——.

Well mouth above ocean in feet					1614
? (Interval unknown)	142	to	142	=	1472
1st SS. (First Sandstone)	66	"	208	=	1406
?	128	"	336	=	1278
2d SS	36	"	372	=	1242
?	208	"	580	=	1034
3d SS	42	"	622	=	992
?	98	"	720	=	894
4th SS	29	"	749	=	865
?	110	"	859	=	755
5th SS gray sand,	19	"	878	=	736
? pocket,	5	"	883	=	731

Wet hole. Cased at 375′.

No paying production. The well was tested at 749′, where some black oil was obtained. Afterwards the well was put down to the next (5th) SS., from which it produced very little green oil.

49. *Horseshoe Well, No.* 1. (117)

July, 1866.

On Pithole, Golden and Cherry Run Oil Co.'s tract, 1¼ miles south-west of Pleasantville. Authority, John F. Carll.

Well mouth above ocean in feet					1559
?	135	to	135	=	1424
1st SS	30	"	165	=	1394
?	120	"	285	=	1274
2d SS	35	"	320	=	1239
?	220	"	540	=	1019
3d SS	28	"	568	=	991
?	106	"	674	=	885
4th SS	27	"	701	=	858
?	104	"	805	=	754
5th SS sand and pebble,	35	"	840	=	719

Wet hole Cased at 300′. Pumped 10′ from bottom.

Best production, a few gallons per day. Green oil. Gas sufficient to fire 2 boilers.

Mud veins at 540′, 695′, and 765′.

50. *Children's Well, No.* 1. (97)

November 4, 1868.

Armstrong farm, lease 101, adjoining Brown Bros. tract, ½ mile south of the borough of Pleasantville. Authority, ——.

Well mouth above ocean in feet					1644
? (Interval unknown)	834	to	834	=	810
4th SS (Fourth Sandstone,) pebble and sand,	12	"	846	=	798
? pocket,	14	"	860	=	784

Wet hole. Cased at 418′.

Best production, 42 barrels per day. Gas sufficient to fire 3 boilers. Black oil.

51. *Brown and Warner Well.* (110)

March, 1868.

Armstrong farm, lease No. 89, ½ mile south of Pleasantville. Authority?

Well mouth above ocean in feet					1585
?	328	to	328	=	1257
1st SS	30	"	358	=	1227
?	427	"	785	=	800
4th SS	18	"	803	=	782

Wet hole. Cased at 340′. Black oil.

Best production, 90 barrels per day.

52. *Maple Shade Well, No.* 1. (105)

July 7, 1868.

Brown, Fertig and Hammond tract, 1¼ miles south of Pleasantville. Authority, ———

Well mouth above ocean in feet					1561
?	768	to	768	=	793
4th SS	18	"	786	=	775
? pocket,	6	"	792	=	769

Wet hole. Cased at 418′.

Best production, 150 barrels per day. Gas sufficient to fire 4 boilers. Black oil.

This record is unreliable.

53. *Holbrook Well, No.* 1. (81)

'August, 1866.

New York and Providence Petroleum Co. farm, 1 mile south-west of Pleasantville Corners. Authority, R. W. Holbrook.

Well mouth above ocean in feet					1546
? (Interval unknown)	104	to	104	=	1442
1st SS. (First Sandstone)	47	"	151	=	1395
?	147	"	298	=	1248
2d SS	20	"	318	=	1228
?	205	"	523	=	1023
3d SS	27	"	550	=	996
?	110	"	660	=	886
4th SS	22	"	682	=	864
?	74	"	756	=	790
5th SS ... pebble,	24	"	780	=	766
?	15	"	795	=	751
6th SS	30	"	825	=	721
? ... pocket,	15	"	840	=	706

Wet hole. Cased at 325′. Pumped 72 feet from bottom.

Best production, 15 barrels per day. Gas sufficient to fire 2 boilers. Black oil. Gravity, 42°.

The 6th sandrock was found to be a hard, close, white sand. The well has been tubed from 756 feet to 816 feet, with same result. Good show of oil and gas in the 4th SS.

54. *Concordia Well.* (174)

1868.

North-east part of James Farrel Farm, lease No. 1, 1¾ miles south-west of Pleasantville. Authority, ———.

Well mouth above ocean in feet					1584
? ... pocket,	100	to	100	=	1484
1st SS	80	"	180	=	1404
?	180	"	360	=	1224
2d SS	28	"	388	=	1196
?	212	"	600	=	984
3d SS	18	"	618	=	966
?	192	"	810	=	774
4th SS	27	"	837	=	747
?	10	"	847	=	737
5th SS ... sand,	40	"	887	=	697

Wet hole. Cased at 350′.

Best production, a "good show" of green oil. Mud vein at 815′.

55. *Baum Well, No.* 1. (175)

1868.

South-east part of north half of J. Farrell farm, 1¼ miles south-west of Pleasantville. Authority, Grant Parkhurst.

Well mouth above ocean in feet					1579
? (Interval unknown)	90	to	90	=	1489
1st SS. (First Sandstone)	100	"	190	=	1389
?	154	"	344	=	1235
2d SS.	20	"	364	=	1215
?	216	"	580	=	999
3d SS	21	"	601	=	978
?	179	"	780	=	799
4th SS	18	"	798	=	781
?	36	"	834	=	745
5th SS	38	"	872	=	707
? pocket,	15	"	887	=	692

Wet hole. Cased at 360′.

Best production, 3 barrels per day. Half enough gas to fire one boiler. Black oil in 4th SS., and Green oil in 5th SS. Gravity, black oil 48°, and green oil 46°.

The above well was drilled in the winter of 1867–68; was tested at 810′, and failed to produce oil in paying quantities; was then drilled to the depth of 878′ with the same result. Yellow pebble at 800′, white pebble at 835′. The well has since been abandoned. I do not think it was ever properly tested at 844′, or in the 5th SS.

56. *Phœnix Well, No.* 1. (86.)

August, 1868.

Bates Petroleum Co. tract, 1½ miles south-west of borough of Pleasantville. Authority, ———.

Well mouth above ocean in feet					1526
?	80	to	80	=	1446
1st SS	56	"	136	=	1390
?	131	"	267	=	1259
2d SS	20	"	287	=	1239
?	218	"	505	=	1021
3d SS	15	"	520	=	1006
?	120	"	640	=	886
4th SS.	25	"	665	=	861
?	74	"	739	=	787
5th SS pebble and sand,	36?	"	775	=	751

Wet hole. Cased at 510′.

Best production, 90 barrels per day. Gas sufficient to fire 2 boilers. Black oil.

[The record of this well, as given in the blank, from the top of the 5th SS. down is evidently wrong. It is as follows:

Top of 5th SS	739′
Thickness	28′
Top of 6th SS	761′
Thickness	14′
Depth of well	775′]

57. *National Well, No. 2.* (87)

National Oil Co. tract, 1½ miles south-west of borough of Pleasantville. Authority, E. L. Pitcher.

Well mouth above ocean in feet					1532
? (Interval unknown)	101	to	101	=	1431
1st SS. (First Sandstone)	29	"	130	=	1402
?	150	"	280	=	1252
2d SS	32	"	312	=	1220
?	226	"	538	=	994
3d SS	21	"	559	=	973
?	41	"	600	=	932
4th SS	69	"	669	=	863
?	78	"	747	=	785
5th SS ... pebble,	15	"	762	=	770
? ... pocket,	7	"	769	=	763

Wet hole. Cased at 300′. Pumped 7′ from bottom.

Best production, 83 barrels per day. Gas sufficient to fire 1½ boilers. Black oil. Gravity, 49°. The 4th SS. is broken by 20′ of slate and shelly rock.

GROUP III.

Wells at Shamburg and Vicinity.

58. *Pierson Well.* (177)

1869.

King lot, ¾ of a mile north-east of Shamburg. Authority, William Morgan.

Well mouth above ocean in feet					1590
?	149	to	149	=	1441
1st SS	60	"	209	=	1381
?	147	"	356	=	1234
2d SS	23	"	379	=	1211
?	241	"	620	=	970
3d SS	12	"	632	=	958
?	98	"	730	=	860
4th SS	25	"	755	=	835

?		77	to	832	=	758
5th SS	pebble at top,	10	"	842	=	748
?	pocket,	13	"	855	=	735

Wet hole. Cased at 360′.

Best production, 10 barrels per day. Half enough gas to fire 1 boiler. Black oil.

59. *Emory Well, No.* 2. (307)

August, 1869.

Walter Scott Petroleum Company's tract, adjoining C. Clark farm, half mile east of Shamburg. Authority, ——.

Well mouth above ocean in feet						1647
? (Interval unknown),		900	to	900	=	747
5th SS. (Fifth Sandstone)		18	"	918	=	729
?		12	"	930	=	717
6th SS	pebble and sand,	35	"	965	=	682
?		7	"	972	=	675

Wet hole. Cased at ——.

Best production, 80 barrels per day. Gas sufficient to fire 1 boiler. Green oil.

This well was put down and tested in the 5th SS., and obtained black oil in small quantities; was afterwards put deeper. This 6th rock is evidently the one called the 5th in Shamburg.

60. *Oak Shade Well, No.* 1. (128)

September 10, 1868.

Clark farm, ten acre lease, near Shamburg. Authority, Geo. W. Arnold, Supt.

Well mouth above ocean in feet						1551
?		120	to	120	=	1431
1st SS		93	"	213	=	1338
?		117	"	330	=	1221
2d SS		30	"	360	=	1191
?		226	"	586	=	965
3d SS		14	"	600	=	951
?		104	"	704	=	847
4th SS		13	"	717	=	834
?		83	"	800	=	751
5th SS	pebble and sand,	65	"	865	=	686

Wet hole. Cased at 345′. Pumped 23′ from bottom.

Best production, 40 barrels per day. No gas of any account. Black oil. Gravity, 36° or 37°. Mud veins at 590′ and 850′.

This well was not drilled through the 5th SS. From other wells near by we judge there remain 15′ more of sand, which would make the entire thickness of the sand 65′+15′=80′. The well from the time it was struck has averaged 25 barrels per day. [Jan., 1869.]

61. *Lady Jane Well, No.* 1. (129)

December 13, 1868.

Clark farm, 5 acre lease, near Shamburg. Authority, Arnold & Lockwood.

Well mouth above ocean in feet					1545
? (Interval unknown)	120	to	120	=	1425
1st SS. (First Sandstone)	116	"	236	=	1309
?	90	"	326	=	1219
2d SS	39	"	365	=	1180
?	213	"	578	=	967
3d SS	22	"	600	=	945
?	98	"	698	=	847
4th SS	36	"	734	=	811
?	66	"	800	=	745
5th SS pebble and sand,	73	"	873	=	672

Wet hole. Cased at 347′. Pumped 22′ from bottom.

Best production, 20 barrels per day. Not gas enough to fire a boiler. Black oil. Gravity, 36° or 37°. Mud veins at 340′, 720′, 810′ and 850′. The well was not drilled through the 5th sand by 15′ or 20′. Small division of slate in this sand.

62. *Lockwood Well, No.* 1. (131)

September 20, 1866.

Clark farm, near Shamburg. Authority, E. M. & T. J. Lockwood

Well mouth above ocean in feet					1498
?	103	to	103	=	1395
1st SS	40	"	143	=	1355
?	139	"	282	=	1216
2d SS	29	"	311	=	1187
?	219	"	530	=	968
3d SS	7	"	537	=	961
?	105	"	642	=	856
4th SS	35	"	677	=	821
?	108	"	785	=	713
5th SS pebble and sand,	46	"	831	=	667
? pocket,	11	"	842	=	656

Wet hole. Cased at 300′. Pumped 40′ from bottom.

Best production, 6 barrels per day. Half enough gas to fire one boiler. Color of oil, between black and green. Gravity, 37°. Mud vein at 645′.

The Lockwood well showed evidences of being on the outskirts of the black oil bearing rock, as it produced a large quantity of salt water, and the Shamburg well in close proximity produced light green oil.

63. *Fink Well.* (127)

February 22, 1867.

On lease No. 12, Pittsburg and Cherry Run Oil Company, Shamburg. Authority, John J. B. Fink.

Well mouth above ocean in feet					1506
? (Interval unknown)	70	to	70	=	1436
1st SS. (First Sandstone,) white sand 60′, gray sand 22′=	82	“	152	=	1354
?	137	“	289	=	1217
2d SS., white sand and pebbles 16′, gray sand 30′=	46	“	335	=	1171
?	185	“	520	=	986
3d SS	25	“	545	=	961
?	95	“	640	=	866
4th SS., pebbly at top, bottom fine and white,	28	“	668	=	838
?	108	“	776	=	730
5th SS ... loose open rock,	57	“	833	=	673
? ... pocket,	2	“	835	=	671

Wet hole. Cased at 340′. Pumped 15′ from bottom.

Best production, 210 barrels per day. Green oil. Gravity, 48°. Gas sufficient to fire from 4 to 6 boilers. Mud veins at 530′, 645′ and 806′. Crevice at 778′.

We are troubled a great deal with mud running into the well at 806′. The well is still producing, and could be made to pump 20 barrels per day if we could exhaust the mud, and keep the well clean [Jan. 1, 1869].

There are shells ranging in thickness, between the regular Sandrocks which I could not give in this blank.

64. *Fink Well, No.* 1. (147]

May 5, 1867.

Farm of Huidekoper Petroleum Company of N. Y., lease No. 1, 10 acres, Shamburg. Authority, John J. B. Fink.

Well mouth above ocean in feet					1516
?	100	to	100	=	1416
1st SS	72	“	172	=	1344
?	126	“	298	=	1218
2d SS	24	“	322	=	1194
?	206	“	528	=	988
3d SS	33	“	561	=	955

?	96	to	657	=	859
4th SS	42	"	699	=	817
?	95	"	794	=	722
5th SS ... pebble at top and bottom,	49	"	843	=	673

Wet hole. Cased at 325′. Pumped 15′ from bottom.

Best production, 75 barrels per day. Gas sufficient to fire 2 boilers. Light green oil. Gravity, 46° to 47°.

The oil rock has a 7′ shell above it.

This well was finished May 3, 1867. The well will produce an average of from 10 to 15 barrels per day now, Jan., 1869. I have two more wells on this same lease, and their records do not vary much from this one. One is now averaging from 25 to 40 barrels per day, and the other about 6 barrels.

65. *Fee Well, No.* 1. (139)

December 23, 1867.

Atkinson farm, lease 106, Shamburg. Authority, F. E. Hammond.

Well mouth above ocean in feet					1539
? (Interval unknown)	817	to	817	=	722
5th SS. (Fifth Sandstone,) pebble and sand,	45	"	862	=	677

Wet hole. Not cased. Seed bag at 322′. Pumped 20′ from bottom.

Best production, 512 barrels per day. Gas sufficient to fire 6 boilers. Green oil. Gravity, 47½°.

This well ceased producing October, 1868. The total production was 49,262$\frac{44}{100}$ barrels The largest production was in the month of May, being 11,200 barrels.

66. *Jack Brown Well, No.* 1. (140)

December 27, 1867.

Atkinson farm, lease 108, Shamburg: Authority, F. E. Hammond.

Well mouth above ocean in feet					1539
?	98	to	98	=	1441
1st SS	100	"	198	=	1341
?	112	"	310	=	1229
2d SS	25	"	335	=	1204
?	221	"	556	=	983
3d SS	13	"	569	=	970
?	110	"	679	=	860
4th SS	25	"	704	=	835
?	111	"	815	=	724
5th SS ... pebble and sand,	40	"	855	=	684

Wet hole. Cased at 320′. Pumped 3′ from bottom.

Best production, 441 barrels per day. Gas supplied at one time 15 boilers. Green oil. Gravity, 47½°. Mud vein at 830′.

This well ceased to produce August 17, 1868. The total production was 65,916$\frac{99}{100}$ barrels, averaging 284$\frac{13}{100}$ barrels per day from the commencement of production to the close. The average price paid for this oil was $2.52 per barrel at the well. During the month of April, 1868, it produced 14,500 barrels, and the same was delivered to Pipe Company, averaging 483⅓ barrels daily.

67. *Skinner Well, No.* 1. (142)

April, 1868.

Lease No. 100, Atkinson farm, Shamburg. Authority, F. E. Hammond.

Well mouth above ocean in feet						1543
? (Interval unknown)		101	to	101	=	1442
1st SS. (First Sandstone)		100	"	201	=	1342
?		110	"	311	=	1232
2d SS		25	"	336	=	1207
?		222	"	558	=	985
3d SS		13	"	571	=	972
?		199	"	770	=	773
4th SS		25	"	795	=	748
?		23	"	818	=	725
5th SS	pebble and sand,	45	"	863	=	680
?	pocket,	5	"	868	=	675

Wet hole. Not cased. Seed bag at 330′. Pumped 18′ from bottom.

Best production, 150 barrels per day. Gas sufficient to fire 2 boilers. Green oil. Gravity, 47½°. Mud vein at 828′.

This well produced 11,611$\frac{38}{100}$ barrels of oil, 43 gallons to the barrel. This was sold at an average price of $3.81 per barrel. Well ceased to produce October, 1868.

68. *Hammond Brothers Well, No.* 1. (144)

January, 1869.

Lease 42, Atkinson farm, Shamburg. Authority, F. E. Hammond.

Well mouth above ocean in feet					1581
?	142	to	142	=	1439
1st SS	100	"	242	=	1339
?	135	"	377	=	1204
2d SS	25	"	402	=	1179

?		196	to	598	=	983
3d SS		13	"	611	=	970
?		107	"	718	=	863
4th SS		40	"	758	=	823
?		100	"	858	=	723
5th SS	pebble and sand,	45	"	903	=	678
?	pocket,	7	"	910	=	671

Wet hole. Cased at 375′. Pumped 5′ from bottom.

Best production, 40 barrels per day. Half enough gas to fire a boiler. Green oil. Gravity, 47½°.

69. *Tallman Farm Well, No. 2.* (135)

November, 1868.

Lease No. 2, Tallman farm, near Shamburg. Authority, Lyman Stewart.

Well mouth above ocean in feet ... 1507

?		70	to	70	=	1437
1st SS		80	"	150	=	1357
?		140	"	290	=	1217
2d SS		15	"	305	=	1202
?		225	"	530	=	977
3d SS		25	"	555	=	952
?		110	"	665	=	842
4th SS		40	"	705	=	802
?		90	"	795	=	712
5th SS	sandy,	43	"	838	=	669
?	pocket,	14	"	852	=	655

Wet hole. Cased at 300′. Pumped 12′ from bottom.

Best production, 8 barrels per day. Gas sufficient to fire one boiler. Green oil. Gravity, 46°. Mud veins at 673′ and at 828′.

At 511′ shelly rock; at 643′ crevice of 3″. From 643′ to 671′ we find crevices of from 2″ to 8″, about 10′ apart; at 672′ a broken rock, and at 677′ a small crevice; at 770′ a crevice of 3″; at 788′ rough rock. From 801′ to 804′ pebble rock. 5th SS. rough and broken, with small crevices. No discovery of effects of torpedo on rock, neither did they (we put in 5) improve materially the production.

NOTE.—The above measurements are taken from Dale's crevice searcher's record, and from the driller's memoranda.

70. *Andrews and Stuart Well, No. 1.* (149.)

Lease 86, Tallman farm, Shamburg. Authority, ———

Well mouth above ocean in feet ... 1538

?		85	to	85	=	1453

1st SS	80	to	165	=	1373
?	145	"	310	=	1228
2d SS	35	"	345	=	1193
?	205	"	550	=	988
3d SS	15	"	565	=	973
?	115	"	680	=	858
4th SS	40	"	720	=	818
?	90	"	810	=	728
5th SS pebble,	50	"	860	=	678

Wet hole. Cased at 320′. Pumped 4′ from bottom.

Best production, 300 barrels per day. Gas sufficient to fire 5 boilers. Green oil. Gravity, 48° to 45°. Mud veins at 688′, 712′, 820′ and 850′.

71. *Chatfield and Tomlinson Well, No.* 1. (183)

March, 1867.

Lease No. 12, Henderson farm, Upper Cherry Run, half mile south of Shamburg. Authority, Chatfield and Tomlinson.

Well mouth above ocean in feet					1536
? (Interval unknown)	100	to	100	=	1436
1st SS. (First Sandstone)	95	"	195	=	1341
?	135	"	330	=	1206
2d SS	30	"	360	=	1176
?	290	"	650	=	886
3d SS	20	"	670	=	866
?	30	"	700	=	836
4th SS	40	"	740	=	796
?	55	"	795	=	741
5th SS pebble and white sand,	56	"	851	=	685

Wet hole. Cased with 3 inch casing at 325′. Pumped 8′ from bottom.

Best production, 15 barrels per day. Gas sufficient to fire 1 boiler. Green oil. Gravity, 47° to 48°.

The 5th SS. was close and white, with a pebble stratum about 20′ from the top.

This farm produces black oil on its east side, from 40 to 60 rods from this well.

72. *Nell Well.* (189)

August, 1865.

Great Republic farm, 1 mile south of Shamburg. Authority, Thomas H. Gamble.

Well mouth above ocean in feet					1416
?	40	to	40	=	1376
1st SS	20	"	60	=	1356

?		190	to	250	=	1166
2d SS		25	"	275	=	1141
?		195	"	470	=	946
3d SS		12	"	482	=	934
?		118	"	600	=	816
4th SS		40	"	640	=	776
?		95	"	735	=	681
5th SS	sand, gray,	10	"	745	=	671
?	pocket,	35	"	780	=	636

Wet hole. Cased at 352′. Pumped 15′ from bottom. Production, ———. Black oil; very little gas.

73. *Sassafras Well, No.* 1. (191)

January, 1869.

Beatty farm, lease No. 48, 1½ miles south-west of Shamburg, at the head of Bull Run, on the upper side of the Titusville and Plumer road. Authority, Phil. Beckman.

Well mouth above ocean in feet					1517
? (Interval unknown)	400	to	400	=	1117
1st SS. (First Sandstone)	50	"	450	=	1067
?	128	"	578	=	939
2d SS	30	"	608	=	909
?	92	"	700	=	817
3d SS	34	"	734	=	783
?	126	"	860	=	657
4th SS	14	"	874	=	643
? pocket,	6	"	880	=	637

Wet hole. Cased at 604′. Pumped 8′ from bottom.

Black oil. This well was being tested when the record was being given, and at that time made a good show of black oil.

74. *Rensselaer Oil Company's Well, No.* 10. (246)

February 12, 1867.

On lot 29, Beatty farm, Cow run, property of Clinton Oil Company, 1½ miles south-west of Shamburg. Authority, N. J. Tompkins, Supt.

Well mouth above ocean in feet						1178
Surface sand		25	to	25	=	1153
?		260	"	285	=	893
1st SS		11	"	296	=	882
?		92	"	388	=	790
2d SS		25	"	413	=	765
?		105	"	518	=	660
3d SS	white sand and pebble,	27	"	545	=	633
?	pocket,	2	"	547	=	631

Wet hole. Cased at 392′ with 3 inch casing. Gas sufficient to fire 2 boilers.

Best production, 20 barrels per day. Green oil. Gravity, 47°.

This well has been producing over two years, and has averaged 16 barrels per day during that time. It is now pumping 10 barrels per day [Feb. 26, 1869].

75. *Vicker and Russell Well.* (192)

January, 1867.

Patterson farm, 1 mile east of Pioneer. Authority, ——.

Well mouth above ocean in feet					1409
? (Interval unknown)	712	to	712	=	697
4th SS. (Fourth Sandstone)	12	"	724	=	685
?	101	"	825	=	584
5th SS	25	"	850	=	559

Wet hole. While drilling this well deeper in hopes of finding a sand-bearing green oil, the tools stuck, and the well was abandoned at the depth of 850′.

GROUP IV.

Wells along Oil Creek Valley, from Foster Farm to Oil City.

76 *Sherman Well, No.* 1. (276)

1861.

On Foster Farm, Oil Creek, three-quarters of a mile above Pioneer. Authority, Josephus Chandler.

Well mouth above ocean in feet						1098
?		147	to	147	=	951
1st SS		18	"	165	=	933
?		132	"	297	=	801
2d SS		15	"	312	=	786
?		118	"	430	=	668
3d SS	sand and pebble,	36	"	466	=	632
?	pocket,	14	"	480	=	618

Wet hole. Seed-bagged on tubing at 300′.

Best production, 1,200 barrels per day. Green oil. Gravity, 45° to 48°.

Gas sufficient to fire 12 boilers.

77. *Porter Well, No.* 1. (231)

1865.

On Foster farm, on the bank of Oil Creek, above Pioneer. Authority ?

Well mouth above ocean in feet						1102
? (Interval unknown)		150	to	150	=	952
1st SS. (First Sandstone)		8	"	158	=	944
?		150	"	308	=	794
2d SS		20	"	328	=	774
?		90	"	418	=	684
3d SS		30	"	448	=	654

Wet hole. Seed-bagged on tubing.

Best production, 200 barrels per day. Green oil.

This well had a connection with the Grand Trunk Well, about ten rods distant from it. When the water was let into the latter well, by drawing the tubing, this well stopped flowing. But when the tubing was replaced in the Grand Trunk, and the pumps started, the Porter Well would again begin to flow.

78. *Grand Trunk Well.* (232)

1865.

On Foster Farm flats, above Pioneer. Authority, —— Richards.

Well mouth above ocean in feet						1099
?		150	to	150	=	949
1st SS		7	"	157	=	942
?		151	"	308	=	791
2d SS		20	"	328	=	771
?		90	"	418	=	681
3d SS	coarse sand and pebble,	30	"	488	=	651

Wet hole. Seed-bagged on tubing at 310′.

Best production, 40 barrels per day. Green oil. Gravity, 45°.

79. *Foster Well, No.* 61. (228)

January, 1868.

On lease No. 61, Foster Farm, Pioneer. Authority, ——— Bishop.

Well mouth above ocean in feet						1398
?		624	to	624	=	774
2d SS		12	"	636	=	762
?		96	"	732	=	666
3d SS	white sand and pebble,	38	"	770	=	628
?	pocket,	5	"	775	=	623

Wet hole. Cased at 630′. Gas sufficient to fire 2 boilers. Best production, 30 barrels per day.

80. *Bishop Well.* (229)

1867.

On Foster Farm, near Pioneer. Authority, ———.

Well mouth above ocean in feet						1360
? (Interval unknown)		20	to	20	=	1340
1st SS. (First Sandstone)		100	"	120	=	1240
?		436	"	556	=	804
2d SS		14	"	570	=	790
?		120	"	690	=	670
3d SS	slate, sand and pebble,	35	"	725	=	635
?	pocket,	10	"	735	=	625

Wet hole. Cased at 560′. Half enough gas to fire a boiler. Best production, 4 barrels per day. Green oil. Gravity, 49°.

81. *Foster Well, Lease* 37. (230)

March, 1867.

On Foster farm, near Pioneer. Authority, —— Bishop.

Well mouth above ocean in feet						1360
?		562	to	562	=	798
2d SS		10	"	572	=	788
?		118	"	690	=	670
3d SS	coarse white sand and pebble,	38½	"	728½	=	631½

Wet hole. Cased at 567′. Gas sufficient to fire one boiler. Best production, 90 barrels per day. Green oil. Gravity, 49°.

82. *Well No.* 1, *Lease No.* 2. (240)

July, 1867.

On the Wood farm, near Petroleum Centre. Authority, J. A. Wharry.

Well mouth above ocean in feet						1481
?		250	to	250	=	1231
1st SS		45	"	295	=	1186
?		240	"	535	=	946
2d SS		50	"	585	=	896
?		130	"	715	=	766
3d SS		20	"	735	=	746
?		77	"	812	=	669
4th SS	sand and pebble,	47	"	859	=	622

Wet hole. Cased at 540′. Gas sufficient to fire 16 boilers. Flowing well. Best production, 150 barrels per day. Green oil. Gravity, 43°.

83. *George K. Anderson Well, Lease No.* 21. (242)

February 14, 1868.

On Wood farm, near Petroleum Centre. Authority, J. A. Wharry.

Well mouth above ocean in feet					1540
? (Interval unknown)	615	to	615	=	925
2d SS. Second Sandstone)	50	"	665	=	875
?	75	"	740	=	800
3d SS	10	"	750	=	790
?	136	"	886	=	654
4th SS pebble,	45	"	931	=	609
? pocket,	49	"	980	=	560

Wet hole. Cased at 660′. Pumped 55′ from bottom.

This well was unproductive. It is situated on the highest hill on the Wood farm.

84. *George K. Anderson Well, Lease No.* 5. (243)

April, 1868.

On Wood farm, near Petroleum Centre. Authority, J. A. Wharry.

Well mouth above ocean in feet					1493
?	565	to	565	=	928
2d SS	45	"	610	=	883
?	110	"	720	=	773
3d SS	8	"	728	=	765
?	107	"	835	=	658
4th SS sand and pebble,	45	"	880	=	613
? pocket,	1	"	881	=	612

Wet hole. Cased at ——. Gas sufficient to fire 2 boilers. Best production, 40 barrels per day.

85. *George K. Anderson Well, Lease No.* 33. (245)

February 12, 1868.

On Samuel Wood farm, near Petroleum Centre. Authority, J. A. Wharry.

Well mouth above ocean in feet					1504
?	570	to	570	=	934
2d SS	50	"	620	=	884
?	75	"	695	=	809
3d SS	6	"	701	=	803
?	143	"	844	=	660
4th SS sand and pebble,	53	"	897	=	607
? pocket,	15	"	712	=	592

Wet hole. Cased at 611′. Pumped 17′ from bottom. Gas sufficient to fire 2 boilers.

Best production, 20 barrels per day. Green oil. Gravity, 43°.

86. *Well No.* 1, *Lease* 36. (219)

On Stevenson farm, at Petroleum Centre. Authority, Geo. K. Anderson.

Well mouth above ocean in feet					1374
? (Interval unknown)	457	to	457	=	917
1st SS. (First Sandstone)	13	"	470	=	904
?	105	"	575	=	799
2d SS	2	"	577	=	797
?	140	"	717	=	657
3d SS	45	"	762	=	612
? pocket,	10	"	772	=	602

87. *Well No.* 1, *Lease* 51. (220)

On Stevenson Farm, at Petroleum Centre. Authority, Geo. K. Anderson.

Well mouth above ocean in feet					1356
?	428	to	428	=	928
1st SS	6	"	434	=	922
?	145	"	579	=	777
2d SS	30	"	609	=	747
?	83	"	692	=	664
3d SS	46	"	738	=	618

88. *Pinner Well.* (221)

February, 1867.

On Robert Stevenson's Farm, about one mile north of Petroleum Centre. Authority, ———.

Well mouth above ocean in feet					1375
?	200	to	200	=	1175
1st SS	40	"	240	=	1135
?	200	"	440	=	935
2d SS	15	"	455	=	920
?	256	"	711	=	664
3d SS sand and pebble,	40	"	751	=	624
? pocket,	14	"	765	=	610

Wet hole. Cased at 450′.

Best production, 25 barrels per day. Green oil. Gravity, 47°. Gas sufficient to fire 2 boilers.

This well is one of those that need some appliance to draw the gas from the well. We are now [February 12, 1869] using a rotary pump, which not only increases the amount of gas, but helps the production. This well is producing as well as it was two years ago (in 1867).

89. *Well No.* 1, *Lease* 134. (213)

On Central Petroleum Co.'s land at Petroleum Centre. Authority, George K. Anderson.

Well mouth above ocean in feet					1112
? (Interval unknown)	193	to	193	=	919
1st SS. (First Sandstone).=	47	"	240	=	872
?	105	"	345	=	767
2d SS	7	"	352	=	760
?	123	"	475	=	637
3d SS	39	"	514	=	598
? pocket,	52	"	566	=	546

90. *Well No.* 1, *Lease* 305. (214)

On Central Petroleum Co.'s land at Petroleum Centre. Authority, George K. Anderson.

Well mouth above ocean in feet					1263
?	340	to	340	=	923
1st SS	50	"	390	=	873
?	103	"	493	=	770
2d SS	7	"	500	=	763
?	110	"	610	=	653
3d SS	48	"	658	=	605
? pocket,	20	"	678	=	585

91. *Well No.* 1, *Lease* 306. (215)

On Central Petroleum Co.'s land at Petroleum Centre. Authority, George K. Anderson.

Well mouth above ocean in feet					1240
?	316	to	316	=	924
1st SS	48	"	364	=	876
?	108	"	472	=	768
2d SS	7	"	479	=	761
?	111	"	590	=	650
3d SS	46	"	636	=	604
? pocket,	12	"	648	=	592

92. *Well No.* 1, *Lease* 37. (217)

On Stevenson Farm, at Petroleum Centre. Authority, Geo. K. Anderson.

Well mouth above ocean in feet					1378
?	459	to	459	=	919
1st SS	13	"	472	=	906
?	105	"	577	=	801
2d SS	2	"	579	=	799
?	140	"	719	=	659
3d SS	45	"	764	=	614
? pocket,	29	"	793	=	585

93. *Swamp Angel* Well, No.* 3. (247)

On lease No. 141, Central Petroleum Co.'s land at Petroleum Centre. Authority, George K. Anderson.

Well mouth above ocean in feet					1098
? (Interval unknown)	185	to	185	=	913
1st SS. (First Sandstone)	15	"	200	=	898
?	133	"	333	=	765
2d SS	6	"	339	=	759
?	121	"	460	=	638
3d SS	43	"	503	=	595
? pocket,	45	"	548	=	550

94. *Swamp Angel Well, No.* 4. (248)

On lease No. 141, Central Petroleum Co.'s land at Petroleum Centre. Authority, Geo. K. Anderson.

Well mouth above ocean in feet					1100
?	160	to	160	=	940
1st SS	40	"	200	=	900
?	140	"	340	=	760
2d SS	6	"	346	=	754
?	119	"	465	=	635
3d SS	45	"	510	=	590
	42	"	552	=	548

95. *Abbe and Bailey Well.* (283)

1866.

On lease 156, Central Petroleum Co.'s land at Petroleum Centre. Authority, ———.

Well mouth above ocean in feet					1099
?	190	to	190	=	909
1st SS	42	"	232	=	867
?	108	"	340	=	759
2d SS	20	"	360	=	739
?	103	"	463	=	636
3d SS	40	"	503	=	596

Wet hole. Seed bag at 350′.

Gas sufficient to fire 1 boiler. Mud vein at 340′.

Best production, 15 barrels per day.

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*It would puzzle an antiquary of the next century to explain this name; but as it was taken from the army sobriquet of the huge piece of ordnance used before Fort Sumter, the name of the well enables us to assign as its probable date, 1861.

96 *Abbe and Bailey Well.* (285)

1865.

On lease 179, Central Petroleum Co.'s land at Petroleum Centre. Authority, ———.

Well mouth above ocean level					**1099**
? (Interval unknown)	**185**	**to**	**185**	**=**	**914**
1st SS. (First Sandstone)	**45**	**"**	**230**	**=**	**869**
?	**110**	**"**	**340**	**=**	**759**
2d SS	**20**	**"**	**360**	**=**	**739**
?	**105**	**"**	**465**	**=**	**634**
3d SS ... sand and pebble,	**40**	**"**	**505**	**=**	**594**
? ... pocket,	**28**	**"**	**533**	**=**	**566**

Wet hole. Cased at 350'. Gas sufficient to fire 1 boiler. Mud vein at 464'.

Best production, 75 barrels per day. Green oil. Gravity, 46°.

97. *Mary Ann Well.* (223)

April, 1868.

On lease No 24, Bennehoff farm, on the bluff between Petroleum Centre and Pioneer. Authority, Edward E. Partridge.

Well mouth above ocean in feet					**1403**
?	**473**	**to**	**473**	**=**	**930**
1st SS	**11**	**"**	**484**	**=**	**919**
?	**139**	**"**	**623**	**=**	**780**
2d SS	**12**	**"**	**635**	**=**	**768**
?	**104**	**"**	**739**	**=**	**664**
3d SS ... pebble and sand,	**41**	**"**	**780**	**=**	**623**

Wet hole. Cased at 624'. Pumped 4' from bottom. Mud vein on top of 3d SS. Best production, 120 barrels per day. Green oil. Gravity, 46°. Gas sufficient to fire 1 boiler. Blower attached as soon as the water was exhausted.

There is a surface sand about 60 feet from the top, and a mountain sand about 100 feet below the surface sand, about 65 feet thick. I believe that wells on the flat do not find either of the above sands. On the hill, we call the sands, first, second, and third sands. Some seed bag in the first sand. I think that the majority of the wells on this farm are seed-bagged in the first sand.

98. *Harding and Jones Well.* (225)

February 7, 1869.

On lease No. 9, Bennehoff farm, on the bluff between Petroleum Centre and Pioneer. Authority, N. Jones.

Well mouth above ocean in feet					1451
? (Interval unknown)	300	to	300	=	1151
1st SS. (First Sandstone)	30	"	330	=	1121
?	185	"	515	=	936
2d SS	10	"	525	=	926
?	100	"	625	=	826
3d SS	20	"	645	=	806
?	133	"	778	=	673
4th SS ..... sand and pebble,	49	"	827	=	624
? ..... pocket,	8	"	835	=	616

Wet hole. Cased at 520′. Pumped 6 feet from the bottom. Mud vein at 820′. Gas sufficient to fire one boiler.

Best production, 50 barrels per day. Green oil. Gravity, 47°.

99. *Courts and Andrews Well.* (226)

July 30, 1869.

On lease No. 8, Bennehoff farm, on the bluff between Petroleum Centre and Pioneer. Authority, T. I. Thompson, Agent.

Well mouth above ocean in feet					1441
?	60	to	60	=	1381
1st SS	30	"	90	=	1351
?	412	"	502	=	939
2d SS	10	"	512	=	929
?	125	"	637	=	804
3d SS	8	"	645	=	796
?	124	"	769	=	672
4th SS ..... pebble,	43	"	812	=	629

Wet hole. Cased at 504′. Pumped 4′ from bottom. Mud vein at 808′. Gas sufficient to fire 2 boilers.

Best production, 180 barrels per day. Green oil. Gravity, 48°.

100. *Stuart Well.* (227)

September, 1868.

On lease No. 7, Bennehoff farm, on the bluff between Petroleum Centre and Pioneer. Authority, John Waddell.

Well mouth above ocean in feet					1411
?	60	to	60	=	1351
1st SS	70	"	130	=	1281

?		420	to	550	=	861
2d SS		20	"	570	=	841
?		48	"	618	=	793
3d SS		14	"	632	=	779
?		108	"	740	=	671
4th SS	sand and pebble,	40	"	780	=	631
?	pocket,	2	"	782	=	629

Wet hole. Cased at 554′. Pumped 4′ from bottom. Mud vein at 744′.

Best production, 14 barrels per day. Green oil. Gravity, 44°.

101. *Blocher Well.* (249)

June, 1868.

Columbia Oil Company's "Story Farm," Oil Creek. Authority, George Boulton, Supt.

Well mouth above ocean in feet						1126
? (Interval unknown)		240	to	240	=	886
1st SS. (First Sandstone)		20	"	260	=	866
?		115	"	375	=	751
2d SS		31	"	406	=	720
?		113	"	519	=	607
3d SS	pebble and sand,	52	"	571	=	555
?	pocket,	1	"	572	=	554

Wet hole. Cased at 500′. Pumped 8′ from bottom.

Best production, 175 barrels per day. Gas sufficient to fire 1 boiler. Green oil. Gravity, 47. No mud veins.

102. *Babcock Well.* (250)

July, 1866.

Columbia Oil Company's "Story Farm," Oil Creek. Authority, George Boulton, Supt.

Well mouth above ocean in feet						1229
?		345	to	345	=	884
1st SS		41	"	386	=	843
?		89	"	475	=	754
2d SS		25	"	500	=	729
?		95	"	595	=	634
3d SS	pebble and sand,	47	"	642	=	587
?	pocket,	5	"	647	=	582

Wet hole. Not cased. Seed bag at 485′. Pumped 10′ from bottom.

Best production, 165 barrels per day. Gas sufficient to fire 3 boilers. Green oil. Gravity, 47°. Mud vein at 598′.

103. *Goe Well.* (251)

Columbia Oil Company's "Story Farm," Oil Creek. Authority, George Boulton, Supt.

Well mouth above ocean in feet					**1262**
? (Interval unknown)	**380**	**to**	**380**	**=**	**882**
1st SS. (First Sandstone)	**32**	**"**	**412**	**=**	**850**
?	**108**	**"**	**520**	**=**	**742**
2d SS	**27**	**"**	**547**	**=**	**715**
?	**98**	**"**	**645**	**=**	**617**
3d SS ... pebble and sand,	**42**	**"**	**687**	**=**	**575**
? ... pocket,	**6**	**"**	**693**	**=**	**569**

Wet hole. Not cased. Seed bag at 530′. Pumped 12′ from bottom.

Best production, 120 barrels per day. Gas sufficient to fire 1 boiler. Green oil. Gravity, 47°. Mud vein at 647′.

104. *Reiter Well.* (252)

Columbia Oil Co.'s "Story Farm," Oil Creek. Authority, George Boulton, Supt.

Well mouth above ocean in feet					**1297**
?	**420**	**to**	**420**	**=**	**877**
1st SS	**35**	**"**	**455**	**=**	**842**
?	**100**	**"**	**555**	**=**	**742**
2d SS	**24**	**"**	**579**	**=**	**718**
?	**94**	**"**	**673**	**=**	**624**
3d SS ... pebble and sand,	**44**	**"**	**717**	**=**	**580**
? ... pocket,	**5**	**"**	**722**	**=**	**575**

Wet hole. Cased at 565′. Pumped 8 feet from bottom.

Best production, 55 barrels per day. Gas sufficient to fire 5 boilers. Green oil. Gravity, 47°. Mud vein at 676′.

105. *Boulton Well.* (253)

October, 1868.

Columbia Oil Co.'s "Story Farm," Oil Creek. Authority, George Boulton, Supt.

Well mouth above ocean in feet					**1380**
?	**462**	**to**	**462**	**=**	**918**
1st SS	**40**	**"**	**502**	**=**	**878**
?	**98**	**"**	**600**	**=**	**780**
2d SS	**20**	**"**	**620**	**=**	**760**
?	**122**	**"**	**742**	**=**	**638**
3d SS ... pebble and sand,	**47**	**"**	**789**	**=**	**591**
? ... pocket,	**5**	**"**	**794**	**=**	**586**

Wet hole. Cased at 470′. Pumped 8 feet from bottom.

Best production, 12 barrels per day. Gas sufficient to fire 1 boiler. Green oil. Gravity, 47°. No mud vein.

106. *Story Centre Well, No.* 1. (284)

July, 1863.

On lease No. 27, Columbia Oil Co.'s "Story Farm," Oil Creek. Authority, George Boulton, Supt.

Well mouth above ocean in feet					1071
? (Interval unknown)	200	to	200	=	871
1st SS. (First Sandstone)	40	"	240	=	831
?	90	"	330	=	741
2d SS	31	"	361	=	710
?	104	"	465	=	606
3d SS sand and pebble,	47	"	512	=	559

Wet hole. Seed-bagged on tubing at 330′. Pumped 10′ from bottom. Gas sufficient to fire 3 boilers.

Best production, 250 barrels per day. Green oil. Gravity, 46°.

107. *Phillips Well, No.* 2. (255).

1861.

Tarr farm, Oil Creek, 2 miles above Rouseville. Authority, ———.

Well mouth above ocean in feet					1063
?	10	to	10	=	1053
Mountain sand	70	"	80	=	983
?	100	"	180	=	883
1st SS	30	"	210	=	853
?	111	"	321	=	742
2d SS	27	"	348	=	715
?	77	"	425	=	638
Sandy shell	2	"	427	=	636
Slate	4	"	431	=	632
"Gray rock"	40	"	471	=	592
3d SS. not through	10	"	481	=	582

Best production, 3,940 barrels per day, by actual measurement. Green oil. Gravity, 46°. Mud vein at 466′. Size of hole, 4 inches. Tubed with 2½ inch tubing without a working barrel.

This well has produced over 600,000 barrels of oil to present date (March 1, 1869), which has been sold at from 10 cents to $14 50 per barrel at the well.

It started to flow before drilling was completed, and threw out the water and oil so furiously that the tubing could not be put in to shut of the water for three days, and even then the tubing had to be chained down to keep it from being blown out of the hole.

The well was lately searched by "Dale's Crevice Searcher," which reported a crevice of 3 inches at the depth of $472\frac{7}{12}$ feet.

108. *Union Well.* (254)

1862.

Tarr Farm, Oil Creek. Authority, ———.

Well mouth above ocean in feet					1072
? (Interval unknown)	195	to	195	=	877
1st SS. (First Sandstone)	30	"	225	=	847
?	100	"	325	=	747
2d SS	25	"	350	=	722
?	130	"	480	=	592
3d SS pebble and sand,	30	"	510	=	562

Wet hole. Not cased.

Best production, 200 barrels per day. Green oil. Gravity, 47°.

109. *Lynn Well, No.* 2. (256)

November, 1867.

Lease No. 192, Tarr farm, Oil Creek. Authority, J. H. Dilks.

Well mouth above ocean in feet					1237
?	100	to	100	=	1137
1st SS	80	"	180	=	1057
?	240	"	420	=	817
2d SS	20	"	440	=	797
?	90	"	530	=	707
3d SS	32	"	562	=	675
?	75	"	637	=	600
4th SS pebble and sand,	42	"	679	=	558

Wet hole. Cased at 607′. Pumped 7′ from bottom.

Best production, 60 barrels per day. Gas sufficient to fire 3 boilers. Green oil. Gravity, 47°.

This well was torpedoed at 649′ and 664′. The production before was 15 barrels, afterwards 40 barrels.

110. *Sterling Well.* (275)

1864-65.

On Tarr farm, Oil creek above Rouseville. Authority, Ambrose John Moran.

Well mouth above ocean in feet						1058
? (Interval unknown)		195	to	195	=	863
1st SS. (First Sandstone)		30	"	225	=	833
?		85	"	310	=	748
2d SS		30	"	340	=	718
?		120	"	460	=	598
3d SS	sand and pebble,	35	"	495	=	563

Wet hole. Cased at 320′. Pumped 1′ from bottom.

Best production, 200 barrels per day. Green oil. Gravity, 44°. Gas sufficient to fire 3 boilers. Mud vein at 465′.

111. *Byron Mitchell Well, No.* 1. (257)

November, 1868.

Lease No. 258, Blood farm, Oil creek, 1½ miles north of Rouseville. Authority, S. Hyland.

Well mouth above ocean in feet						1315
?		685	to	685	=	630
2d SS		29	"	714	=	601
?		1	"	715	=	600
3d SS	pebble and sand,	40	"	755	=	560
?	pocket,	3	"	758	=	557

Wet hole. Cased at 685′.

Best production, 120 barrels per day. Gas sufficient to fire 1 boiler. Green oil. Gravity, 44°.

This well was doing 20 barrels when a torpedo was exploded in it, which had a damaging effect, reducing the production to 8 barrels.

112. *Lady Suffolk Well.* (258)

June, 1868.

Lease No. 240, Blood farm, Oil creek, 1½ miles north of Rouseville. Authority, A. B. Mudge.

Well mouth above ocean in feet						1340
?		465	to	465	=	875
1st SS		40	"	505	=	835
?		105	"	610	=	730
2d SS		26	"	636	=	704
?		61	"	697	=	643
3d SS	"gray rock,"	25	"	722	=	618
?		24	"	746	=	594
4th SS	pebble and sand,	37	"	783	=	557

Wet hole. Cased at 706′. Pumped 7′ from bottom.

Best production, 85 barrels per day. Gas sufficient to fire 2 boilers. Green oil. Gravity, 45°.

113. *Ætna Well.* (259)

Lease No. 18, Rynd farm, Oil creek, 1 mile north of Rouseville. Authority, George K. Anderson.

Well mouth above ocean in feet					1049
? (Interval unknown)	190	to	190	=	859
1st SS. (First Sandstone)	28	"	218	≡	831
?	114	"	332	=	717
2d SS	18	"	350	=	699
?	115	"	465	=	584
3d SS	32	"	497	=	552
? pocket,	14	"	511	=	538

114. *Pacific Well, No.* 1. (260)

January, 1863.

Lease No. 17, Rynd farm, Oil creek, 1 mile north of Rouseville. Authority, Hendrickson and Walker.

Well mouth above ocean in feet					1051
?	195	to	195	=	856
1st SS	25	"	220	=	831
?	115	"	335	=	716
2d SS	28	"	363	=	688
?	110	"	473	=	578
3d SS	35	"	508	=	543
? pocket,	7	"	515	=	536

Wet hole. Not cased. Seed bag at 460′.

Best production, 12 barrels per day. Gas sufficient to fire one boiler. Green oil. Gravity, 45°.

On the Blood and Rynd farms there is a gray SS. lying immediately over the third rock. Most operators think that this gray sand is an oil producing rock.

115. *Well No.* 23. (261)

August, 1867.

Rynd farm, Oil creek, one mile north of Rouseville. Authority, Supt. of Rynd farm.

Well mouth above ocean in feet					1049
?	188	to	188	—	861
1st SS	23	"	211	=	838

?		117	to	328	=	721
2d SS		26	"	354	=	695
?		121	"	475	=	574
3d SS	pebble and sand,	28	"	503	=	546
?	pocket,	10	"	513	=	536

Wet hole. Not cased. Seed bag at 190′.

Best production, 10 barrels per day. Green oil. Gravity, 46°.

There never was an instance on this farm of one well interfering with another. All the wells producing to-day are pumping oil only. No advantage is gained in the amount of gas by the use of casing, and casing is not much used on the farm. [March 2, 1869.]

116. *Keir Well, No.* 1. (262)

1862.

Rynd farm, Oil creek, one mile north of Rouseville. Authority, ———.

Well mouth above ocean in feet						1046
? (Interval unknown)		191	to	191	=	855
1st SS. (First Sandstone)		23	"	214	=	832
?		117	"	331	=	715
2d SS.		26	"	357	=	689
?		121	"	478	=	568
3d SS	pebble and sand,	30	"	508	=	538

Wet hole.

Best production, 250 barrels per day. Green oil. Gravity, 45°.

This well flowed while being drilled, from the 2d rock, or at 357′. We tubed in this sand, and the well yielded 250 barrels per day for some time, but we spoiled it by shutting off the flow by a stop cock; well was afterwards put deeper, but no increase of oil.

117. *Emory Well, No.* 1. (263)

January, 1865.

A. Buchanan farm, on Cherry Run, one-half mile above Rouseville. Authority, A. A. Emory.

Well mouth above ocean in feet					1062
?	212	to	212	=	850
1st SS	37	"	249	=	813
?	106	"	355	=	707
2d SS	30	"	385	=	677

?		111	to	496	=	566
3d SS	pebble and sand,	34	"	530	=	532
?	pocket,	13	"	543	=	519

Wet hole. Not cased. Seed bag at 360′.

Best production, 28 barrels per day. Half enough gas to fire a boiler. Green oil. Gravity, 43°. Mud vein at 516′.

Very near this well a well was put down which had to be abandoned while drilling in the 2d SS., but it was pumped for an experiment and produced 900 barrels of dark oil.

118. *Well No.* 13. (264)

December, 1866.

Farm of Union Petroleum Co. of New York, Cherry Run, ¾ of a mile above Rouseville. Authority, E. W. Hinds, Supt.

Well mouth above ocean in feet						1092
? (Interval unknown)		221	to	221	=	871
1st SS. (First Sandssono)		67	"	288	=	804
?		86	"	374	=	718
2d SS		26	"	400	=	692
?		120	"	520	=	572
3d SS	pebble and sand,	31	"	551	=	541

Wet hole. Not cased. Seed bag at 380′.

Green oil. Gravity, 46°. The well is now averaging 3 barrels per day. [March 3, 1869.]

119. *Well No.* 6. (265)

—— ——.

Farm of Union Petroleum Co. of New York, Cherry Run, ¾ of a mile above Rouseville. Authority, E. W. Hinds, Supt.

Well mouth above ocean in feet						1092
?		218	to	218	=	874
1st SS		67	"	285	=	807
?		85	"	370	=	722
2d SS		32	"	402	=	690
?		118	"	520	=	572
3d SS	pebble and sand,	41	"	561	=	531
?	pocket,	29	"	590	=	502

Wet hole Not cased. Seed bag at 375′.

Green oil. Gravity, 46°.

120. *Munson Well.* (267)

October, 1866.

Lease No. 1, Curtin Oil Co.'s tract, on Cherry run, 1 mile above Rouseville. Authority, ———.

Well mouth above ocean in feet					1109
? (Interval unknown)	240	to	240	=	869
1st SS. (First Sandstone)	32	"	272	=	837
?	108	"	380	=	729
2d SS	28	"	408	=	701
?	132	"	540	=	569
3d SS ... pebble and sand,	34	"	574	=	535
? ... pocket,	20	"	594	=	515

Wet hole. Not cased. Seed bag at 410′. Pumped 30′ from bottom.

Best production, 120 barrels per day. Gas sufficient to fire 1 boiler. Green oil. Gravity, 46°.

This well is near the celebrated Reed well, and one record will answer for both.

121. *Champion Well, No.* 2. (268)

February, 1868.

Buchanan farm, Rouseville. Authority, Superintendent of Rouseville Oil Co.

Well mouth above ocean in feet					1053
?	200	to	200	=	853
1st SS	33	"	233	=	820
?	117	"	350	=	703
2d SS	25	"	375	=	678
?	115	"	490	=	563
3d SS	15	"	505	=	548
? ... pocket,	15	"	520	=	533

Wet hole. Not cased. Seed bag at 360′.

Best production, 100 barrels per day. Gas sufficient to fire 2 boilers.

This well only produced for two days; stopped short off. Think it pumped what oil it did from the 2d sand. Think it best not to drill through the 3d sand, less likely to get salt water.

122. *Elizabeth Well.* (269)

1862.

Clapp farm, Oil creek, between Rouseville and Oil City. Authority?

Well mouth above ocean in feet					1011
? (Interval unknown)	200	to	200	=	811
1st SS. (First Sandstone)	20	"	220	=	791
?	140	"	360	=	651
2d SS	15	"	375	=	636
?	85	"	460	=	551
3d SS	30	"	490	=	521
? pocket,	110	"	600	=	411

Wet hole. Cased at 373′.

Best production, 100 barrels per day. Green oil.

The well is now being pumped from the 2d SS.; is pumping a large amount of water with a little oil, perhaps 6 barrels on an average. [March 4 1869.]

GROUP V.

Wells along the Allegheny River from Oil City to West Hickory.

123. *Siverly and Gardner Well.* (270)

1866.

Lease No. 11, Siverly farm, Allegheny river, 1¼ miles above Oil City. Authority, J. W. Gardner, Supt.

Well mouth above ocean in feet					1018
?	260	to	260	=	758
1st SS	20	"	280	=	738
?	110	"	390	=	628
2d SS	20	"	410	=	608
?	80	"	490	=	528
3d SS pebble and sand,	31	"	521	=	497
? pocket,	19	"	540	=	478

Wet hole. Cased at 400′.

Best production, ———. Half enough gas to fire a boiler. Green oil. Gravity, 46°.

This well is a fair type of 15 wells on the Siverly farm, which altogether produced 40 barrels per day. They are pumped by heads.

124. *Lowell Well.* (271)

March, 1867.

Howard Oil Association lease, Alcorn farm, Allegheny river, 3 miles above Oil City. Authority, L. Lowell.

Well mouth above ocean in feet					1022
? (Interval unknown)	278	to	278	=	744
1st SS. (First Sandstone)	8	"	286	=	736
?	70	"	356	=	666
2d SS	9	"	365	=	657
?	29	"	394	=	628
3d SS	21	"	415	=	607
?	81	"	496	=	528
4th SS ... shelly,	34	"	530	=	492
? ... pocket,	20	"	550	=	472

Wet hole. Cased at 100′.

Best production, 6 barrels per day. Half enough gas to fire a boiler. Green oil. Gravity, 42°.

The wells on the river in this locality do not afford much gas.

Torpedoes have been tried in some wells above Oil City with no advantage.

125. *Vandergrift Well, No.* 1. (272)

August, 1868.

On 10 acre tract, by H. M'Clintock farm, on Allegheny river, about 3 miles below Oleopolis. Authority, J. J. Vandergrift.

Well mouth above ocean in feet					1045
?	197	to	197	=	848
1st SS	20	"	217	=	828
?	74	"	291	=	754
2d SS	30	"	321	=	724
?	20	"	341	=	704
3d SS ... pebble,	18	"	359	=	686
? ... pocket,	11	"	370	=	675

Wet hole. Seed-bagged on tubing at 120′.

Best production, 1 barrel per day. Green oil. Gravity, 40°. Half enough gas to fire a boiler.

This well is in the vicinity of a number of wells, all of which are pumping oil from the 2d sand. The oil is of lighter color, but heavier gravity, than the Oil creek oil. Some of these wells have been pumping for six years. [March 5, 1869.]

126. *Madden Well.* (273)

1865.

On Anderson Petroleum Co.'s farm, Allegheny river, ¼ mile below the mouth of Pithole creek. Authority, ———.

Well mouth above ocean in feet					1038
? (Interval unknown)	160	to	160	=	878
1st SS. (First Sandstone)	44	"	204	=	834
?	83	"	287	=	751
2d SS … sand and pebble,	18	"	305	=	733
? … pocket,	4	"	309	=	729

Wet hole. Seed bag at 170′.

Best production, 60 barrels per day. Amber oil. Gravity, 42°.

It is said that the 3d sand has not been found in this locality, though wells have been drilled 600′ and 800′ deep.

127. *Smith and Schribel Well.* (299)

June, 1869.

Hussey and M'Bride farm, Henry's Bend, Allegheny river. Authority, ———.

Well mouth above ocean in feet					1033
?	149	to	149	=	884
1st SS	22	"	171	=	862
?	62	"	233	=	800
2d SS	10	"	243	=	790
Red slate	11	"	254	=	779
3d SS	12	"	266	=	767
? … pocket,	3	"	269	=	764

Wet hole. Cased at 150′.

Best production, 8 barrels per day. Amber oil. Gravity, 42°.

Another well on the side hill 109′ above this well went through 3d SS. at 375′. This well is about 10′ above surface of river.

128. *Hunter, Herbert and Carll Well.* (306)

1869.

Hunter run, ½ mile from Allegheny river, opposite Tionesta, Forest county. Authority, John F. Carll.

Well mouth above ocean in feet					1098
?	160	to	160	=	938
1st SS	8	"	168	=	930
?	90	"	258	=	840
2d SS	8	"	266	=	832

?	15	to	281	=	817
3d SS	10	"	291	=	807
?	15	"	306	=	792
4th SS ... coarse pebble in red mud,	15	"	321	=	777
?	116	"	437	=	661

Wet hole. Some oil and gas.

129. *Hamilton Well.* (200)

September, 1869.

Hickory Farm Oil Co., Allegheny River at the mouth of West Hickory creek, Forest county. Authority, ———.

Well mouth above ocean in feet					1106
? (Interval unknown)	100	to	109	=	1006
1st SS. (First Sandstone)	25	"	125	=	981
?	35	"	160	=	946
2d SS ... not through,	6½	"	166½	=	939½

Wet hole. Not cased. Seed bag at 104′.

Best production, 60 barrels per day. Green oil. Gravity, 33°.

This well, like most others on this and adjoining farms, pumps a large amount of water, which is supposed to come into the well with the oil. November 5, 1869, it was pumping 6 to 10 barrels of heavy oil with 100 to 200 barrels of water.

GROUP VI.

Wells at Enterprise in Warren County.

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130. *Benedict Estate Well, No.* 1. (167)

Summer of 1865.

Benedict Estate Farm, Enterprise, Warren county. Authority, ———.

Well mouth above ocean in feet					1241
?	192	to	192	=	1049
1st SS	50	"	242	=	999
?	58	"	300	=	941
2d SS	6	"	306	=	935
?	29	"	335	=	906
3d SS	10	"	345	=	896
?	97	"	442	=	799
4th SS	6	"	448	=	793

?		14	to	462	=	779
5th SS	pebble,	15	"	477	=	764
?	pocket,	10	"	487	=	754

Wet hole. Cased at 342′. Pumped 10 feet from bottom.

Best production, 8 barrels per day. Half enough gas to fire 1 boiler. Green oil. Gravity, 47°.

131. *M'Kinney Well, No.* 1. (170)

March, 1869.

Lease No. 9, Benedict Estate Farm, Enterprise, Warren county. Authority, C. B. M'Kinney.

Well mouth above ocean in feet						1228
? (Interval unknown)	estimated,	183	to	183	=	1045
1st SS. (First Sandstone)		50	"	233	=	995
?		79	"	312	=	916
2d SS		10	"	322	=	906
?		88	"	410	=	818
3d SS		20	"	430	=	798
?		10	"	440	=	788
4th SS	pebble,	16	"	456	=	772
?	pocket,	18	"	474	=	754

Wet hole. Cased at 308′.

Best production, 180 barrels per day. Gas sufficient to fire 2 boilers. Green oil. Gravity, 45°.

The 4th SS. is the oil-bearing rock. The 2d SS. contains large veins of salt water. The well has been run one month and is as good as ever on an average.

132. *M'Kinney Well. No.* 2. (171)

August, 1868.

Lease 17, Benedict Estate, Enterprise, Warren county. Authority, C. B. M'Kinney.

Well mouth above ocean in feet						1231
?	estimated,	196	to	196	=	1035
1st SS		60	"	256	=	975
?		58	"	314	=	917
2d SS	pebble,	14	"	328	=	903
?		86	"	414	=	817
3d SS		20	"	434	=	797
?		10	"	444	=	787
4th SS	pebble,	21	"	465	=	766
?	pocket,	17	"	482	=	749

Wet hole. Cased at 335′. Pumped 6 feet from bottom.

Best production, 30 barrels per day. Gas sufficient to fire one boiler. Green oil. Gravity, 45°.

A torpedo improves the well. 2d SS. contains salt water. 4th SS. is oil producing.

GROUP VII.

Wells at Church Run and in its Vicinity, in Crawford County.

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133. *Eureka Well.* (202)

November, 1865.

On land of Atlantic and Great Western Petroleum Company, on Church Run, one and a-half miles north-east of Titusville, Crawford county. Authority, H. S. Rogers, Superintendent.

Well mouth above ocean in feet					1333
? (Interval unknown)	230	to	230	=	1103
1st SS. (First Sandstone)	67	"	297	=	1036
?	174	"	471	=	862
2d SS	15	"	486	=	847
?	18	"	504	=	829
3d SS. very coarse with pebbles,	70	"	574	=	759
? pocket,	10	"	584	=	749

Wet hole. Cased at 350′. Pumped 15′ from bottom.

Best production, 175 barrels per day. Gas sufficient to fire 3 boilers. Green oil. Mud veins are found in some of the wells on the higher ground, but were rare in the Eureka well.

This well, from the long time it has been pumping, can be considered to be one of the most remarkable in this region, having been one of the first drilled on Church Run. It now averages 140 barrels per week. [Feb., 1869].

When first started it produced about 52 barrels per day. It gradually ran down until in May 1868, it was producing about 25 barrels per week.

It was then cleaned out, casing and seed-bag being drawn, and torpedoed in the middle of the 3d sand. Casing was then put in, and it was started up, and for some days produced 175 barrels per day. Referring to the books, I find that in one week it pumped 910 barrels of the best, clear Church Run oil. We find that a torpedo, every six weeks, is required to be exploded in the middle of the third sand, to open up and clean the rock. There is still sufficient gas to run the engine. [Feb., 1869].

The company are now pumping their eleventh well. Out of this number but two have proved failures.

134. *Niagara Well, No.* 1. (201)

May, 1867.

On three acre tract, formerly Cadwallader and Morse, at Church Run, Crawford county. Authority, ———.

Well mouth above ocean in feet						1318
? (Interval unknown)		218	to	218	=	1100
1st SS. (First Sandstone)		40	"	258	=	1060
?		200	"	458	=	860
2d SS		15	"	473	=	845
?		16	"	489	=	829
3d SS	pebble and sand,	65	"	554	=	764
?	pocket,	9	"	563	=	755

Wet hole. Cased at 300′. Pumped 13 feet from bottom.

Best production, 25 barrels per day. Gas sufficient to fire 1 boiler. Green oil. Gravity, 45°.

135. "*Ike*" *Weed Well.* (204)

January, 1867.

On tract of Williams, Severance and Co., on Church Run, one and a quarter miles north-east of Titusville, Crawford county. Authority, L. H. Severance, Treasurer.

Well mouth above ocean in feet						1400
?		298	to	298	=	1102
1st SS		30	"	328	=	1072
?		209	"	537	=	863
2d SS		15	"	552	=	848
?		19	"	571	=	829
3d SS	pebble,	66	"	637	=	763
?	pocket,	9	"	646	=	754

Wet hole. Cased at 400′. Pumped 35′ from bottom.

Best production, 15 barrels per day. Oil green. Gravity, 47°. Gas sufficient to fire 1 boiler.

Well is now (February 12, 1869,) pumping on an average 6 barrels per day. Are only running it in the day, making but 12 hours pumping. With torpedoes, has pumped 10 barrels per day.

136. *Humphrey Well, No.* 2. (205)

December, 1868.

On Atlantic and Great Western Petroleum Co.'s tract on Church Run, 1½ miles north-east of Titusville, Crawford county. Authority, ———.

Well mouth above ocean in feet						1431
? (Interval unknown)		330	to	330	=	1101
1st SS. (First Sandstone)		60	"	390	=	1041
?		175	"	565	=	866
2d SS		25	"	590	=	841
?		20	"	610	=	821
3d SS	sand and pebble,	62	"	672	=	759
?	pocket,	3	"	675	=	756

Wet hole. Cased at 404′. Pumped 14′ from bottom.

Best production, 300 barrels per day. Green oil. Gravity, 45°. Gas sufficient to fire 3 boilers.

This well is now (February 9, 1869,) pumping 65 barrels per day.

137. *Yreka Well, No.* 1. (206)

August, 1868.

On the Weed Farm, Church Run, 1½ miles north-east of Titusville, Crawford county. Authority, Chester Morse.

Well mouth above ocean in feet						1460
?		365	to	365	=	1095
1st SS		63	"	428	=	1032
? including 2d SS		212	"	640	=	820
3d SS	sand and pebble,	60	"	700	=	760

Wet hole. Cased at 365′.

Best production, 70 barrels per day. Gas sufficient to fire 2½ boilers. Green oil. Gravity, 45°.

138. *King Well.* (211)

1864.

On Watson Flats, one-half mile south of Titusville, Crawford county. Authority, ——.

Well mouth above ocean in feet					1174
?	170	to	170	=	1004

1st SS.	20	to	190	=	984
?	190	"	380	=	794
2d SS	35	"	415	=	759

Wet hole. Cased at 180′. Pumped 10 feet from bottom.

Best production, 10 barrels per day. Green oil. Gravity, 44°. One-half enough gas to fire a boiler.

This well has been pumped nearly all the time since it was struck, while in the immediate vicinity many have been abandoned and left without any seed bag. It is the opinion of many, that if three-fourths of the holes on the flat were seed-bagged the other fourth would be paying wells at the present time [about Jan., 1869].

GROUP VIII.

Miscellaneous Wells.

139. *Major Well.* (279)

Summer of 1867.

On Major farm, section 1618, Sparta township, 2½ miles S. E. of Spartansburg, Crawford county. Authority, Wm. Johns.

Well mouth above ocean in feet					1606
? (Interval unknown)	205	to	205	=	1401
1st SS. (First Sandstone)	15	"	220	=	1386
?	240	"	460	=	1146
2d SS. white, coarse,	25	"	485	=	1121
?	260	"	745	=	861

Wet hole. Seed-bagged on tubing at 210′. Gas sufficient to fire 15 boilers. No oil.

This well was tested by pumping it for one day, when it gave signs of flowing. The second day the rods and valves were drawn, when it commenced flowing gas and water at the rate of about 100 barrels per day, and continued thus for six months. The tubing was then drawn to explode a torpedo. It was afterwards tubed, and flowed water for 9 months, when the seed-bag burst. Since then nothing has been done to it. At one time the water flowed outside of the tubing, and was thrown 15 feet high.

140. *Well No.* 175. (301)

Triumph Oil Company, Triumph, Warren Co., 2 miles south-west of Tidioute. Authority, Superintendent of farm.

Well mouth above ocean in feet						1691
? (Interval unknown)		224	to	224	=	1467
1st SS. (First Sandstone)		28	"	252	=	1439
?		205	"	457	=	1234
2d SS		18	"	475	=	1216
?		85	"	560	=	1131
3d SS		22	"	582	=	1109
?		120	"	702	=	989
4th SS	not through it,	40	"	742	=	949

No well on this farm has drilled through the 4th sand; though some have gone 80′ into it. No oil is obtained below 10′ to 20′ from the top of the rock. At the present time this well is being drilled deeper into the sand.

Most of the wells in Dennis Run use gas pumps. [Nov. 4, 1869.]

141. *Jocelyn Well, No.* 1. (294)

April 14, 1866.

Located on lease No. 1, plot 7, section C of the Jocelyn oil lands (old Green farm), 4½ miles south-east of Pleasantville, and 3 miles south of Neilltown, Forest county. Authority, A. H. Jocelyn, Vice President.

Well mouth above ocean in feet						1603
?		112	to	112	=	1491
1st Mt. SS		50	"	162	=	1441
?		150	"	312	=	1291
2d Mt. SS		25	"	337	=	1266
?		243	"	580	=	1023
1st oil SS		78	"	658	=	945
?		27	"	685	=	918
2d SS		25	"	710	=	893
?		70	"	780	=	823
3d SS		45	"	825	=	778
?		17	"	842	=	761
4th extra SS	white pebble,	15	"	857	=	746
?		143	"	1000	=	603

Wet hole. Not cased. Pumped at 800′ from top.

Best production, 1 barrel per day. Little gas. Black oil. Gravity, 40° and 47°. Mud vein 790′ to 798′.

"Owing to accident, losing tools in this well, and fishing for them several weeks in a stiff mud vein at top of the pebble rock, the well was spoiled. She was afterwards drilled to 1000′ as an experiment, to ascertain the fullest extent of geology, but found nothing of importance below 857′, and the full regular oil-bearing rocks ending at 857′. It is my opinion, after careful study and practical knowledge, that this land is equal to the best oil territory, and with further developments will prove an extended oil field. This geology differs from all below on Stuart's Run."

The foregoing records are published to secure them against accidental loss by fire or otherwise, and to place them in a convenient form for reference. Many of them are imperfect, and some, without doubt, do not correctly represent the stratification of the rocks drilled through; still they are of great value, and when the whole series is completed there will be a sufficient number of approximately reliable ones to exhibit in a very satisfactory manner the general underground structure to any one who will take the trouble to study it out. Their value will be more apparent years hence than it is now, when the old districts are again worked over, as they undoubtedly will be, and the early records are not otherwise to be obtained. During the first development of a district, when scores of wells are in operation, almost every well owner or employé has a knowledge of the rocks sufficient for all practical purposes; but when the district has become partially exhausted and the original operators have moved forward to other fields, leaving new men behind who know very little of the history of the wells, then these printed records will be sought after and appreciated.

If this plan of preserving records had been adopted when oil was first discovered and followed up to the present time what a vast amount of valuable material would now be accessible to all. Thousands of faithfully kept registers have been made. Some were merely written in a convenient place on the derrick or engine house and perished with the well; some were kept in daily hand books which were discarded and destroyed as they became old; many have been consumed by fire, that inevitable visitant of all our oil towns; and others are now stowed away among the oil region relics of those who have left the country, and scattered almost to the four corners of the earth. Scarcely one in a hundred of them can now be found.

Those who have well records in their possession can now have them published and preserved with the papers of the survey by mailing them to the headquarters of the Oil District at Pleasantville, Pennsylvania. They will be printed in pamphlet form from time to time as they accumulate in sufficient numbers, for free distribution to those who have contributed them.

In examining these records it will be observed that the first column of figures gives the thickness of each sand-rock or interval; the second, the depth from the surface to both the top and bottom of each sand-rock or interval; and the third, the elevation above ocean (where it is known), so that it can be seen at a glance, without any calculation, just what the thickness of each formation is, how far it lies below the surface, and how high above the ocean. This form of keeping records, if universally adopted, will be found to greatly facilitate their comparison and study.

CHAPTER II.

Extra List of E. S. Nettleton's Venango Oil Well Levels of 1868'–9; *without records.*

Of the following wells (numbered by Mr. Nettleton as explained in Chapter I) he obtained no records of the rocks passed through, nor of the depth, quantity and quality of the oil. But it is proper to place his own levels of their mouths, (corrected by Mr. Carll, May, 1877, for the final datum level of Oil City Union Depot RR. grade above ocean level in Raritan Bay=1008') on permanent record here, because descriptions of these wells may exist in the hands of persons who can insert them hereafter in this book.

The first column of figures is for the *Running Number of Well in the Index* to this book.

The second column gives Mr. Nettleton's *Original Number of Well*, taken from his notes.

The third column gives *Name of Well.*

The fourth column *Location of Well.*

The fifth column *Height of Well-mouth above ocean in Raritan Bay.*

I. *Pleasantville Borough and Vicinity.*

282	2	Woodford	S. M. Dunham Farm	1714
283	55	Meadville No. 1	“ “ “	1637
284	56	Wing	“ “ “	1691
285	58	Jennie	“ “ “	1677
286	59	M'Gee	“ “ “	1665
287	3	Byers & Satterfield	Morrison Farm	1715
288	4	Grey Eagle	“ “	1704
289	6	Comer	Jack Farm	1692
290	9	Orchard	Newkirk Farm	1693
291	10	Sherman	“ [E. of borough]	1591

292	12	M'Clintock	Small Farm	1672
293	—	" gas well	" [N. of borough]	1606
294	21	Lone Star	James Farm	1704
295	24	Excelsior	" " [formerly	1661
296	25	Eagle	" " Merrick Farm]	1662
297	26	Morning Light	" "	1062
298	27	Manual or Reliance	A.W.Brown's lot, Merrick st.	1652
299	17	Fisher Bros	Brown & House Tract	1637
300	22	Lightning	" " "	1691
301	112	United States, No. 38	" " "	1637
302	19	Ruby	Mattison Farm	1622
303	—	New well pumping in 1875	" "	1566
304	13	Green Flag	A. W. Brown Farm	1693
305	32	Pierce and Bagley	Connelly Farm	1675
306	39	Collins Bros., No. 17	Mitchell Farm	1676
307	40	" " " 18	" "	1683
308	62	Black Flag	Holeman & Newkirk tract	1675
309	61	Clark & Allen	Geroe Farm	1687
310	33	Goss & Goal, No. 3	Shugert Farm	1665
311	34	Shakely	" "	1655
312	36	Goss & Goal, No. 1	" "	1649
313	38	Beam, No. 3	" "	1666
314	35	Myrtle, Fisher Bros	Zuver Farm	1642
315	41	Fisher Bros., No. 1	" "	1633
316	281	Goss & Carll, Rainbow, No. 1,	Hebert Farm	1633
317	45	" " No. 2,	" "	1640
318	46	Goss Bros	" "	1637
319	282	Fisher Bros., No. 2	" "	1650
320	47	" No. 5	" "	1639
321	63	John Hoop	" "	1659
322	160	Jenkins	" "	1663
323	64	Dalzelle	" "	1648
324	65	Fisher Bros., No. 6, (gas)	" "	1660
325	66	Hyde & Coleman	" "	1666
326	67	Spartansburg	" "	1664
327	48	Iron City, Burchfield	Porter Farm	1633
328	50	Grant, No. 1	" "	1617
329	51	" No. 2	" "	1610
330	52	Harmonial, No. 3	" "	1611
331	68	M'Grew Bros	Brown Bros. Tract	1651
332	69	" "	" " "	1642
333	71	Haskell	" " "	1622
334	72	Marr	" " "	1597
335	73	Freeman	" " "	1598
336	74	Queen	" " "	1575
337	75	Fisher, "C"	" " "	1576
338	76	Beaufort	" " "	1577
339	114	Branch	Jack Farm	1601
340	115	Cady, No. 1	" " [S. of borough]	1605
341	106	Collins Bros., No. 7	Armstrong Farm	1604
342	96	Rice, No. 2	" "	1644
343	107	Stock	" "	1617

344	108	Hart	Armstrong Farm	1588
345	109	Wilson	“ “	1581
346	111	Harmonial, No. 4	“ “	1617
347	77	Little Giant	Vesta Petroleum Co	1566
348	78	Pierce and Bagley	“ “ “	1570
349	79	Brooklyn	“ “ “	1563
350	98	Carroll	Ensign Farm	1643
351	99	Homestead, No. 3	“ “	1637
352	100	Young America	“ “	1621
353	101	Jones	“ “	1609
354	82	Smith	Davis Farm	1552
355	80	Holbrook, No 2	N. Y. & Providence Pet. Co.,	1559
356	83	Maple Shade, No. 1	S. Q. Brown and others	1549
357	104	“ “ No. 3	“ “ “	1575
358	84	Johnson	“ “ “	1554
359	91	Rock	Byles Farm	1585
360	92	Foggin		1601
361	93	Smith		1625
362	94	Hughes & Harrison		1633
363	103	Lady	Byles Farm	1590
364	85	Phœnix, No. 2	Bates Petroleum Co	1532
365	88	National, No. 1	National Petroleum Co	1536
366	89	Say & Williams	Hebert “Mill Farm” Reserve	1521
367	90	Collins, Pratt & Sumner	Mill Farm	1531
368	176	Whale	Independent Oil Co	1608
369	161	Nameless	Clark Farm	1619
370	162	Clark, No. 1	“ “	1617
371	164	Golden, No. 2	Golden Farm	1560
372	123	M'Nair	Bean Farm	1504
373	126	Odell	“ “	1506
374	122	Lamb	Lamb Farm	1529
375	290	Sherman	J. Y. Siggins Farm	1585

II. Shamburg and Vicinity.

376	130	Shamburg, No. 1	Shamburg	1498
377	132	“ No. –	“	1506
378	146	“ No. 5	“	1500
379	133	“ No. 8	“	1499
380	134	Hewins, No. 6	“	1505
381	148	Fink, No. –	“	1517
382	136	Tallman	Tallman Farm	1532
383	137	Long & Raymond	“ “	1537
384	138	R. W. Hall	“ “	1537
385	141	Hidden	Atkinson Farm	1541
386	143	Myers & Sherman	“ “	1541
387	145	Pierce & Bagley	“ “	1516

388	150	Tallman, No. 112	Tallman Farm	1540
389	151	F. W. Andrews, No. 111	" "	1538
390	152	Spear		1542
391	153	Fee, No. 7		1543
392	154	S. P. & Co., No. 3		1564
393	155	" No. 6		1568
394	156	" No. 14		1569
395	157	" No. 65		1581
396	159	Farwell	Farwell Farm	1602
397	184	M'Nair, No. 1	Cherry Run	1445
398	185	" No. 2	" "	1480
399	186	Brown, No. 1	Great Republic Tract	1429
400	187	" No. 2	" " "	1424
401	188	Lambert	" " "	1428
402	193	Pryer, No. 1	Bull Run	1308
403	194	Orthodox	" "	1257
404	195	Johnson	" "	1242
405	196	Graff	" "	1145

III. On Oil Creek.

406	197	Noble	Oil Creek	1098
407	216	Stevenson, No. 30	Robert Stevenson Farm	1368
408	218	G. K. Anderson, No. 35		1370
409	224	Dickinson, No. 10	Bennehoff Farm	1435
410	233	Coquette	Egbert Farm	1090
411	234	Jersey	"	1080
412	235	Keystone	"	1077
413	236	Maple Shade	"	1075
414	239	Central Pet. Co., No. 380	Petroleum Centre	1461
415	241	Wood, No. 3	" "	1501
416	244	G. K. Anderson, No.—	" "	1489
417	266	Reed	Rouseville	1115

IV. At Enterprise.

418	166	Go in and win	Enterprise	1249
419	168	Reed	"	1256
420	169	Harvey	"	1231
421	172	Williard	"	1234
422	173	Smith	"	1233
423	199	Ash	Ash Farm near Enterprise	1551

V. Church Run and Vicinity.

424	203	Sutter	Church Run	1343
425	207	Crosley	“	1465
426	208	Newton	“	1482
427	209	Germania	“	1486
428	210	Augusta	Watson Flats	1174

VI. Miscellaneous.

429	295	Jocelyns, No. 2	Green Farm, head of Stewart's Run	1541
430	296	Hinkley	Hinkley Farm, head of Allender Run	1378
431	297	Pratt	Pratt Farm, Pithole Creek	1472
432	298	Blanchard	Near President	1250
433	300	Hamilton	Mouth of West Hickory Cr.	1106

CHAPTER III.

Extra List of J. F. Carll's Venango Oil Well Levels in 1874.

Of the following wells lying along the lines run for the purpose of obtaining reliable original data for Report of Progress I, 1874, whatever records were afterwards obtained are given in other parts of this volume, and may be found by reference to the names and numbers of the wells arranged in alphabetical order in the Index. Such wells and others of which no geological description has yet been obtained, are here recorded *in the geographical order of the lines run*, with their *levels above ocean in Raritan Bay*, adjusted May, 1877, on the basis of the final determination of Oil City Union Depot RR. grade=1,008′.

LINE A.

From Pleasantville to Church Run.

This line was run in 1874 from Ennis Hill along the Plank Road to Hinkley's Refinery at Titusville; thence over the Parker farm hill across the Spring Creek road and down into the valley of Church Run; thence through the developments on the Beach and M'Guire farms, and thence to the highest point on the A. J. Kerr farm.

434	Sherman Well	J. Y. Siggin's Farm	1585
435	Peanut "	King Farm—(M'Gee hill)	1468
	D. A. V. & P. RR. crossing of Plank Road at East Titusville		1184
436	E. Well of Double rig	Bunker Hill Lot, Titusville	1209
437	W. " " "	" " " "	1208
438	Fowler, No. 1	Parker Farm	1512
439	Parker, No. 1	" "	1554
440	" No. 3	" "	1532
441	" No. 5	" "	1551

442	Scott, No. 3	J. Weed Farm, Church Run	1558
443	Crock	Barnsdall Farm, Church Run	1538
	B. M. on Conglomerate S. of Spring Creek Road. Barnsdale Farm, Church Run, crown of hill		1542
444	Flowing water well	Church Run Valley, top of d. pipe.	1328
445	Surface of water	“ “ near above well	1325
446	Phillips, No. 1	Beach Farm, Church Run	1557
447	“ No. 2	“ “	1549
448	Grey, No. 2	“ “	1557
449	“ No. 4	“ “	1569
450	“ No. 6	“ “	1561
451	Thomas Bros. Well	M’Guire Farm, “	1589
452	Boyer and Lufkins Well	“ “	1592
453	M’Cort, No. 3	“ “	1602
454	“ No. 5	“ “	1604
455	Smiley, No. 6	A. J. Kerr Farm, “	1603
456	“ No. 16	“ “	1607
457	“ No. 18	“ “	1603

LINE B.

From Pleasantville to Tionesta.

This line was run in 1874 from Ennis Hill to Farmers' Hotel; thence along the Plank Road to Cashup Hill; thence along Johnson's Run road to Dawson's Corners, and thence along the Pleasantville and Tionesta highway to the river.

458	M’Gee	S. M. Dunham Farm	1664
459	Preston	“ “	1657
460	Pettibone	Wrigglesworth Tract	1612
461	M’Vey	“ “	1613
462	Merrill	“ “	1600
463	M’Vey	“ “	1607
464	Preston	“ “	1592
465	“	“ “	1585
466	Benedict	Benedict and S. Q. Brown Farm	1604
467	Orchard	“ “ “	1594
468	Benedict & Son	“ “ “	1565
469	“ “	“ “ “	1565
470	Ledsham	“ “ “	1555
471	“ No. 2	“ “ “	1557
472	Wood No. 13	William Wood Farm	1565
473	Hoyt	“ “	1570
474	Stoddard and Frank, No. 4	“ “	1555
475	“ “ No. 3	“ “	1558
476	“ “ No. 2	“ “	1554

477	Goss & Goal	Nesbitt Lot	1530
478	Fisher, No. 2	Tyrrell Farm	1518
	B. M. Rock opposite Farmers' Hotel	" "	1523
479	Well near Oil Dump	" "	1518
480	Harsh	Bean Farm	1513
481	"	" "	1506
482	"	" "	1512
483	Hoag	" "	1505
484	"	" "	1502
485	Minor, No. 1	S. Minor Farm	1494
486	" No. 2	" "	1491
487	Slingerland	Stewart Tract, Cashup	1600
488	Holmes & Brown, No. 1	Harsh " "	1611
489	Harsh, No. 8	" " (near road) Cashup	1622
490	" No. 10	" " (W. of road) "	1610
491	" No. 11	" " " "	1603
492	" No. 14	" " " "	1598
493	" No. 13	" " " "	1593
494	" No. 6	" " " "	1569
495	" No. 16	" " " "	1565
496	" No. 3	" " " "	1555
497	" No. 2	" " " "	1552
498	" No. 7	" " (near road) Cashup	1623
499	Bronson, No. 8	Bronson Tract, Cashup	1634
500	" No. 7	" " "	1640
501	" No. 10	" " "	1639
502	" No. 6	" " "	1646
503	" No. 4	" " "	1655
504	" No. 5	" " "	1657
505	" No. 2	" " "	1653
506	Emery-Octave, No. 1	Harsh Tract, Cashup	1659
507	Kratzer	" " "	1660
508	Charles Scott, No. 1	" " "	1663
509	M'Laughlin,* No. 1	A. W. & J. F. Brown Tract, Cashup	1640
510	M'Laughlin, No. 5	" " " "	1624
511	Kratzer, No. 1	" " " "	1614
512	Chase & Collins	"Huidekoper," (N. road,) Cashup,	1632
513	"	" .... (S. road,) "	1632
514	Gas well, 1865	Northern New York Oil Company	1550
	B. M. on rock near oak N. of road, 75' S. E. of Johnson's Run		1491
	B. M. on oak S. of road W. line of Dawson Farm		1490
	B. M. on large rock, Dawson's Corners		1404
	Stewart's Run Bridge, Dawson Farm		1400
	S. W. under Bridge, Aug. 24, 1874. Stewart's Run		1395

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*1,000 barrels.

515	Old Well	In Run W. of road and N. of Dawson's house. Dawson Farm	1417
516	Old Well	In field back of Dawson's barn, and S. of house. Dawson Farm	1406
	B. M. on rock extending across the road N. of Huling's house		1664
	River Hill crown, road centre, S. of Huling's house		1670
517	Hunter Well, 1872, 1,200′ deep—no 3d SS	G. S. Hunter Farm	1630
	B. M. on large rock W. of road	230′ above spring	1492
	"Hillside Spring"	G. S. Hunter Farm	1471
	RR. track road crossing	Tionesta Depot	1060
518	Hunter Well, 1865. Heavy oil.	Near Tionesta Depot	1055
519	Hunter, Hebert & Carll Well, 1869	Hunter Run, ½ mile from river	1098
	Surface of water in the Allegheny River, August 26, 1874. Opposite Tionesta Dépôt		1044

LINE C.

From Pleasantville to Tidioute.

This line was run in 1874 from Ennis Hill along Neilltown road to Cattaraugus school house; thence north to Shelmandines; thence across farms to Lower Colorado; thence along the main development to Clapp farms; thence along Triumph road and down Dennis run to the Allegheny river.

520	Orchard well		Newkirk Farm		1693
	B. M. on rock. Cattaraugus School House cor.				1637
521	Freeman well		Lockwood Farm		1614
	B. M. rock centre roads. Shelmandine's Corners				1603
522	Roof well*		Hill Tract,	Colorado	1344
523	Jenkins No.2 or Hill	No. 6	" "	"	1350
524	Roof,	No. 1	" "	"	1333
525	Hill,	No. 2	" "	"	1331
526	"	No. 4	" "	"	1329
527	"	No. 5	" "	"	1330
528	Dickson,	No. 1	M'Donald, R. & Co. Farm	"	1356
529	Briar Hill,	No. 1	Hill Tract,	"	1382
530	" "	No. 2	" "	"	1398

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*B. M. on hemlock stump.

531	Dickson, (new)		Hill Tract,	Colorado	1306
532	Colorado Co.,	No. 12	“ “	“	1331
533	M Kinney,	No. 3	“ “	“	1333
534	Colorado,	No. –	“ “	“	1341
535	Benson,	No. 1	“ “	“	1373
536	Colorado*	No. 3	“ “	“	1410
537	“	No. –	“ “	“	1491
538	“	No. 9 (?)	“ “	“	1514
539	Joy,	No. 4	Joy “	“	1526
540	“	No. 5	“ “	“	1529
541	“	No. 11	“ “	“	1550
542	“	No. 7	“ “	“	1561
543	“	No. 9	“ “	“	1575
544	“	No. 10	“ “	“	1597
545	“	No. 14	“ “	“	1613
546	“	No. 12	“ “	“	1605
547	“	No. 13	“ “	“	1629
548	Magnolia,	No. 2	Benson Tract,	“	1621
549	Hutson,	No. 2	Ware Tract, N. E. of	“	1574
550	Ottman,	No. 1	“ “	“	1565
551	“	No. 2	“ “	“	1569
552	“	No. 3	“ “	“	1569
553	Horton,	No. 1	“ “	“	1569
554	Wheelock,	No. 1	“ “	“	1564
555	“ (abandoned)		“ “	“	1567
556	Tuttle		“ “	“	1558
557	M'Kelvey & Co.,	No. 2	Potter Farm		1556
558	“ “	No. 3	“ “		1555
559	Peter Schmick,	No. 1	Irvine Farm		1519
560	“ “	No. 2	“ “		1524
561	Cummings,	No. 1	Cumming's Lease		1603
562	“	No. 3	“ “		1606
563	Buckhorn,	No. 3	Irvine Farm (?)		1608
564	“	No. 1	“ “		1605
565	“	No. 2	“ “		1610
566	“	No. 4	“ “		1611
567	Hunter,	No. 3	Jennings & Hunter Tract		1609
568	Morse & Hunter,	No. 1	“ “ “		1544
569	Hague & Cummings,	No. 7	New London Oil Co		1515
570	“ “	No. 5	“ “ “		1510
571	Cushing & Grandin,	No. 6	“ “ “		1552
572	Hague & Manwarring		“ “ “		1558
573	Cushing & Grandin,	No. 9	“ “ “		1569
574	“ “	No. 8	“ “ “		1607
575	Wm. Hague,	No. 5	“ “ ‘		1610
576	Cushing & Grandin,	No. 2	“ “ “		1617
577	Hague,	No. 9	“ “ “		1621
578	“	No. 10	“ “ “		1621
579	“	No. 8	“ “ “		1629

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*One of the wells making connection between the different systems of exploration.

580	Hague, No. 6	New London Oil Co	1620
581	Capt. Butler, No. 8	" " "	1633
582	" " No. 4	" " "	1626
583	" " No. 6	" " "	1638
584	" " No. 2, (abandoned,)	New London Oil Co.	1645
585	Clapp, No. 23	E. E. Clapp Farm	1652
586	" No. 24	" " "	1647
587	" No. 43	" " "	1648
588	" No. 10	" " "	1626
589	" No. 9	" " "	1603
590	" No. 1	" " "	1575
591	" No. 3	" " "	1561
592	" No. 50	" " "	1601
593	" No. 53	" " "	1603
594	" No. 51	" " "	1619
595	" No. 52	" " "	1616
596	" No. 16	" " "	1628
597	" No. 33	" " "	1700
598	" No. 34	" " "	1729
599	" No. 35	" " "	1744
600	" No. 36	" " "	1746
601	2d well E. of Lockhart's house,	Jason (J. Clapp) Farm, N. of road	1729
602	" " " " "	" " " " S. "	1726
603	3d " " " "	" " " " " "	1723
604	4th " " " "	" " " " " "	1720
605	3d " " " "	" " " " N "	1724
606	Grandin, No. 4	Triumph Oil Co	1727
607	Shaw	" " "	1693
608	O. K. well of Radure, Watson & Co	" " "	1677
609	Merrick	" " "	1651
610	Robbins	" " "	1647
611	Radure, W. & Co., No. 5	" " "	1664
612	" " " No. 2	" " "	1664
613	" " " No. 4	" " "	1670
614	D. W. Clark, lease 126	" " "	1678
615	R., W. & Co., No. 3	" " "	1677
	B. M. on stump	Ramsey & Baker's corner, Triumph,	1689
	Crown of hill near by	On the main street, Triumph	1689
616	Sproul, lease 207	Triumph Oil Company	1671
617	R., W. & Co.—"Dr. Day well"	" " "	1672
618	Collins No. 2, lease 236	" " "	1652
619	" "Turkey," lease 236	" " "	1646
620	Gillen, No. 17	Dennis Run & N. Y. Oil Co	1600
621	" No. 8	" " " "	1577
622	" No. 7	" " " "	1576
623	Dennis Run, No. 20	" " " "	1547
624	Wm. Andrews (abandoned)	" " " "	1500
625	" " "	" " " "	1499
626	Red Rig	" " " "	1399
627	Gen. Kearney, lease 13 (?)	N. Y. & Allegheny Tract	1352
628	Jones' "Petroleum"	" " "	1312

629	Porter	N. Y. & Alleghony Tract	1311
630	Clark, N. Y. & A., No. 3	" " "	1290
631	Keystone	Tidioute & Warren Tract	1238
632	Lafayette	" " "	1232
633	Pilgrim, lease 33	" " "	1201
634	" lease 33	" " "	1196
635	Shaw, lease 35	" " "	1191
636	Neill, lease 42	" " "	1177
637	M'Comb, lease 46	" " "	1171
	Top of rail	Bridge over Gordon Run	1114
	Surface of water, Aug. 20, '74,	Junc. Gordon Run & Allegheny river,	1095
	Top of rail	Opp. Tidioute Depot	1113

LINE D.

From Pleasantville to Rouseville.

This line was run in 1874 from Ennis hill along the oil development to East Shamburg; thence over the Plumer or "Yankee Ridge road" to the Keech farm school house; thence over the Franklin and Warren pike to the upper end of the Humboldt Refinery enclosure; and thence down the valley of Cherry run to Oil creek.

638	Harsh, E.	Harsh Tract, Pleasantville	1700
639	" new	" " "	1691
640	" new 28	" " "	1702
641	Fisher, No. 3	Hebert Tract, Pleasantville	1649
642	" No. 8 (Marlin, No. 1),	" " "	1647
643	Marlin, No. 2	" " "	1660
644	M'Caslin (1874)	Porter Farm, Pleasantville	1665
645	Benedict Gas Well	" " "	1656
646	Tabor & Thompson (green oil)	" " "	1659
647	Haskell	Wood & Wright, 10 acres	1659
648	Main & Oles (Fisher D.)	Brown Bros. Farm	1656
649	Rice, now Wesley	Armstrong Farm	1642
650	Jim Hart	" "	1630
651	Armstrong (drilling 1874)	" "	1629
652	Mountain	" "	1634
653	Harmonial, 9	" "	1625
654	Mountain, 4	" "	1626
655	Smithman	" "	1619
656	Newbury	Davis Farm	1596
657	"	" "	1557
658	Bronson (Phœnix) No. 6	Bates Petroleum Company	1548
659	" D	" " "	1541
660	Bates (ab'd), No. 2	" " "	1546

661	Scott, No. 11	Hebert Reserve	1538
662	“ (best)	“ “	1538
663	Collins & Perry, No. 1	Mill Farm	1525
664	“ “ No. 2	“ “	1531
665	“ “ No. 5	“ “	1529
666	Bronson, “ No. 2	“ “	1515
667	Galloway, lease 6	Independent Oil Company Tract	1604
668	Bagley, lease 26	“ “ “ “	1617
669	F. Andrews, lease 27	“ “ “ “	1624
670	Bagley, lease 26	“ “ “ “	1624
671	Winsor, lease 34 (?)	“ “ “ “	1628
672	B. F. Brown, Old 31	“ “ “ “	1630
673	Persons, No. 6	“ “ “ “	1607
674	Emory, No. 5	Old Walter Scott Oil Company	1649
675	“ No. 6	“ “ “ “	1647
676	“ No. 2	“ “ “ “	1647
677	“ No. 3	“ “ “ “	1642
678	Clark, No. 4	C. Clark Farm	1649
679	“ No. 1	“ “	1638
680	“ No. 2	“ “	1641
681	“ No. 13	“ “	1640
682	“	A. Clark Farm	1634
683	Croutz & Roy, No. 3	“ “	1636
684	Clark	“ “	1637
685	Avery Well	“ “	1632
686	“ “	“ “	1632
687	Pole Tool Well	Brummagen Farm	1628
	Old Pithole Pl'k Rd. cross'g,	“Woggefarth City”	1567
688	Lavinus	At Cherry Run Crossing	1419
689	Petty, Lease 3	Clark Farm	1490
	B. M. on rock 40 ft. S. of pike,	Keech Farm Corners	1514
690	Keech Farm Well, left	“ “ “	1512
691	Bogue Farm Well, left	Near Keech Farm Line	1522
	B. M. on rock, right	E. crown of Bogue Hill	1588
	Opposite old house	Bogue Farm	1574
	Opposite old log barn	W. crown of Bogue Hill	1594
	Intersection of old road	To Pithole E	1573
	“ “ “	To Pithole W	1589
	Old RR. crossing	Reno and Pithole RR	1446
	Brook by large oaks	Hillside N. E. of Prathers	1423
	Road up Cherry run	Prathers Corners	1309
	Bridge over Cherry run	N. E. of Plumer	1299
692	Prather Farm Well, 1865	At this crossing	1299
	B. M. on 2d course of stone,	S. W. corner of Plumer P. O	1317
	Bridge over Cherry run	S. W. end of Plumer	1264
	B. M. rock under maple, left,	N. E. of Humbolt Refinery	1300
	RR. bridge over Cherry run,	Near S.W. cor of Refinery enclosure,	1216
693	Sulphur Well on Flats	Cherry Run Petroleum Co	1195
694	“ “ “	“ “	1158
	Top of RR. track	Opp. Cornen & Beer's office	1112
695	Baker Well	Rynd Farm	1098
696	Sulphur Well	“ “	1097

697	Abandoned (Reed, No. 2 ?)	Rynd Farm	1102
698	Old Reed Well	" "	1108
699	Keystone, G. Whitman	" "	1105
700	Brevort, No. 6	Brevort Petroleum Co	1094
701	" No. 3	" "	1091
702	" No. 30	" "	1090
703	" No. 22	" "	1097
704	" No. 29	" "	1098
705	Union Co. Well (ab'd)	Union Petroleum Co	1081
	RR. bridge over Cherry run,	Buchanan Farm, near N. line	1072
706	Camp Well, No. 69 (?)	" "	1063
707	" " No.	" "	1062
708	" " No.	" "	1062
709	Gillott	" "	1059
710	Cochran	" "	1055
711	Reed (old U. S.)	" "	1052
712	M'Mann	" "	1053
713	Long & Gibson,	" "	1057
	or Double rig.		
714	Patten (?)	" "	1055
715	Willoughby... Double rig.	" "	1050
716	"	" "	1049
	O. C. and A. R. RR. Depot	Rouseville	1036
717	Grant Well	South of Depot	1026
718	Allen Wright, No. 17	" "	1025
719	Point Well	Near Oil Creek	1025
	Surface of water, Sep. 10 1874,	Junction Oil Creek and Cherry Run	1020

CHAPTER IV

First Selection of J. F. Carll's Warren and Venango Oil Well Record in 1876.*

The scientific value of well records is limited by many conditions, each of which should be separately considered. But there can be no question of the utility of preserving them from destruction by publishing them in the printed archives of a State Geological Survey. Their publication will answer many questions put by men of science abroad and at home ; will place at the service of investigators the original data of our own calculations ; will invite the intelligence of thoughtful men in the Oil Region to a more careful scrutiny of such data ; and above all, will induce many well borers to be more precise and complete in making up future records, and perhaps to communicate them for comparison. In this way only will it be possible to arrive at broad and true answers to moot questions which no one has yet succeeded in satisfactorily answering, except in a very local and unconnected manner.

Technical names and terms ought to be explained to those who have no business at the wells, but such a glossary would be a long one.

The height of each well mouth above the fixed ocean level datum of the Coast Survey should always be given ; but it is often wanting, and then the value of the well record becomes comparatively low.

The well records of one locality have been grouped together ; but it must be understood that not one in ten of all the paying and non-paying wells which have been sunk has been obtained, and the whole list is therefore but a recorded selection.

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*This Chapter was published separately in the Proceedings of the American Philosophical Society, Philadelphia, December 15, 1876, and copies were distributed among persons in the Oil Region to obtain their concurrence.

The first groups have been obtained from Companies operating in Warren and Venango counties; others will be added from Clarion and Butler counties from similar collections made in those counties, to show the geological persistency of the Oil-Sand Group from Tidioute to Butler.

The figures in the final column of each well record represent the *height above ocean level in Raritan Bay,* New York Harbor, of well mouth, top of 1st sand, &c. &c., as corrected by surveys, May, 1877, after the determination of Oil City Union Depot RR. grade as=1008′.

GROUP 1.

COLORADO DISTRICT.

720. *Colorado Well, No.* 1.

August 12, 1870.

Located in Warren county, South-west township, Pa., on Pine creek, or East Oil creek, between Pleasantville and Tidioute, and 2 miles north-east of Enterprise.

Level of well mouth above ocean level in feet*................					1373
Casing to rock..............................	36	to	36	=	1337
Interval of measures unnamed..............	234	"	270	=	1103
First Sand (1st SS.).........................	57	"	327	=	1046
Interval unnamed............................	88	"	415	=	958
Second Sand (2d SS.)........................	24	"	439	=	934
Interval unnamed............................	81	"	520	=	853
Third Sand (3d SS.).........................	46	"	566	=	807
Well carried down in "pocket"..............	9	"	575	=	798

Size of hole, 5½″; drilled wet; cased with 3¼″ casing to shut off the water. Seed bag on casing below 2d SS., say at about 445′.

A "mud vein" 8′ below top of 3d SS., at 528′.

The oil sand was of uniform color [white and pebbly] with the softest stratum on top, and appearances indicate that nearly if not quite all the oil comes in the well at 5′ or 6′ below the top of the 3d sand, between which points both torpedoes were exploded.

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*In the first edition Proc. A. P. S., Dec. 15, 1876, the Oil City datum not yet being established, this level of 1373′ was printed 1367′, and all the other figures in that edition are also 6′ too low.

This well was pumped about thirty days, part of the time with a gas pump attached and part of the time without one.* The largest natural production without the gas pump was 4 barrels per day. The first day after the gas pump was applied the production increased to 6 barrels, from which point it gradually declined to less than 4 barrels.

On the 21st of November, 1870, it was torpedoed at a point 5½ feet below the top of the 3d SS. It then produced 160 barrels per day for the first few days, but gradually declined to 13 barrels per day by the 1st of June, in the following year, 1871. The gas pump was again tried with no satisfactory results, and taken off as worthless or of no benefit to the well.

On December 21, 1871, the production had declined to 1 barrels. A one-quart nitro-glycerine torpedo was then exploded in the oil sand, which increased the production to 40 barrels per day. But this continued only a day or two. It immediately commenced decreasing, and on the 1st of August, 1872, about two years from the time it was first pumped, it had declined to its first natural production of 4 barrels per day.

During this month, August, 1872, the "volcanic treatment" was tried upon the well at three different times. The first time 4 burners were used, resulting in a slight increase of gas, but no increase of oil.†

The second time 7 burners were used, same results.

The third time 9 burners were used, same results, leaving the well at the end of the treatment with an appreciable increase of gas, but no improvement in the supply of oil.

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*Every well has more or less gas, which, separating from the oil at the bottom of the well, rises between the tubing and casing and escapes through a pipe provided for the purpose, at the well mouth. A "gas pump" is an instrument which is attached to this escape pipe to relieve the rising gas from atmospheric pressure, and thus facilitate and increase its flow. In many cases it not only augments the flow of gas but very materially improves the oil production of the well. A "Rotary" or "Gas Blower" is sometimes used for the same purpose.

†The "volcanic burner" is a patented article designed to increase the production of a well by intensely heating the fluid at the bottom. It consists of a case filled with chemical ingredients. After lowering it to the desired spot the materials are ignited by an electric spark. The operation is repeated until the desired heat has been obtained, when the tubing is at once put in and pumping resumed.

A "scratcher" was also used in this well once, but with no benefit.*

By a series of experiments in casing and pumping, the salt water is supposed to come into the well with the oil near the top of the 3d SS.

721. *Colorado Well, No.* 2.

Located on Colorado Oil tract, 15 rods south of No. 1, and at the same altitude.

Dry cased hole. Salt water in second sand. Cased below second sand. Produced no oil and only about a quarter of a barrel of salt water per day.

Sand rocks about the same thickness as in well No. 1, but the third sand was of inferior quality, very little of it being white.

722. *Colorado Well, No.* 3.

August 20, 1870.

Located 13 rods, N. 78° E., from No. 1.

Level of well mouth above ocean level in feet					1410
Casing to rock	34	to	34	=	1376
? (Interval unknown)	279	"	313	=	1097
1st SS. (First Sandstone)	44	"	357	=	1053
?	97	"	454	=	956
2d SS	21	"	475	=	935
?	84	"	559	=	851
3d SS	45	"	604	=	806
? pocket,	8	"	612	=	798

Mud vein in 3d SS. at 566 feet.

Cased at 475 feet.

3d SS.
top 6′ gray, with but little white.
next 2′ white and soft (good).
next 20′ white, but close.
bottom 17′ mixed gray and white.

When first pumped it yielded only one barrel of oil per day and continued thus until a "scratcher" was used, which brought the production up to 15 barrels for a few days. It then declined to 4 barrels, when a 3 pint nitro-glycerine torpedo was inserted 6 feet from the top of the third SS. After this it produced 100 barrels per day for a short time.

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* A "scratcher" is a round brush, about three feet long, made of steel wire. When it is to be used the tubing is drawn from the well, a few barrels of benzine are poured in and the scratcher is attached to the sucker rods and run down to the oil rock, where it is worked up and down for some time to scratch or scrub the walls of the well and assist the benzine in the dislodgment of whatever may have accumulated there.

The use of benzine in this well gave no satisfactory results, probably on account of salt water.

Three-pint torpedo exploded 8 feet below top of 3d sand, May 30, 1872. Daily production increased to 10 barrels, but declined to 5 barrels in ten days. Torpedoed again, Dec. 18, 1872. Result not stated.

723. *Colorado Well, No.* 4.

August 20, 1872. (?)

Located 5½ rods south-east of M'Kinney's north-east corner.

Level of well mouth 20' feet lower than No. 1					1347
Drive pipe to rock	31	to	31	=	1316
? (Interval unknown)	205	"	236	=	1111
1st SS. (First Sandstone)	45	"	281	=	1066
?	109	"	390	—	957
2d SS	21	"	411	=	936
?	84	"	495	=	852
3d SS	43	"	538	=	809
? pocket,	6	"	544	=	803

Drilled dry. Cased at 412'.

Best natural production, 2 barrels per day.

The hole was dry when the 3d sand was struck, and remained so until the drill had penetrated the 3d sand 5½ feet. At this point oil and salt water came in. The best part of the sand was from 505 feet to 515 feet; below this the sand was poor.

The first	torpedo	was exploded	5	feet below	top	of rock.	
" second	"	"	10	"	"	"	
" third	"	"	5	"	"	"	
" fourth	"	"	15	"	"	"	May 4, 1872.

The production was increased by the first torpedo, but soon settled back to about 5 barrels per day. The same effect followed the second and third. The fourth was a one-quart nitro-glycerine blast, but it made very little increase in the oil flow. Benzining, flooding the sandrock with oil, and "scratching" the walls, all failed to produce beneficial results.*

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*A well is "flooded" by pouring sufficient fluid in at the top, while the pump remains idle, to fill up the shaft several hundred feet, more or less, above the oil sand. Benzine and crude oil are both used for this purpose; the object being to saturate the rock, under pressure, in order that the paraffin or other accumulations which may have adhered to its surface or obstructed its pores may be loosened and removed with the fluid when the pump is again started.

724. *Colorado Well, No.* 5.

Struck about August, 1871.

Located 14 rods south of No. 4.

Level of well mouth above ocean level, No. 1+31′=					1404
Drive pipe to rock	70	to	70	=	1334
1st and 2d sands and intervening measures "regular" to top of 3d SS	423	"	493	=	911
3d SS	43	"	536	=	868
? pocket,	7	"	543	=	861

Wet hole. Cased at 217′. Crevice in 3d sand 11′ below the top.

Natural production, 60 barrels per day at commencement, but declined quite rapidly to 15 barrels. Remained thus for some time until torpedoed, when it declined to 10 barrels.

First	torpedo	exploded	5	feet	below	top of 3d SS.
Second	"	"	11	"	"	"
Third	"	"	5	"	"	"
Fourth	"	"	26	"	"	"

The production steadily declined; no beneficial results following the use of any of the torpedoes, except a slight temporary increase from the last.

The volcanic treatment was also tried without any marked effect.

The 3d sand was better than the average sands of other wells drilled in this neighborhood. The best and softest stratum commenced 3 feet below the top of the rock and continued to 7 feet. From 11 feet downward to the bottom of the rock the sand was good, but not as soft as in the upper division.

725. *Colorado Well, No.* 6.

August 16, 1871.

Level of well mouth above ocean					
Casing to rock	32	feet.	32	=	
?	318	to	350	=	
1st SS	40	"	390	=	
?	107	"	497	=	
2d SS	19	"	516	=	
?	81	"	597	=	
3d SS	46	"	643	=	
? pocket,	8	"	651	=	

Wet hole. Cased at 516′.

Third sand very close and hard. Natural production, less than 1 barrel per day.

First torpedo exploded 7 feet below top of 3d SS. Production increased to 10 barrels, but soon declined to 5 barrels.

Second torpedo 6 feet lower. Increase to 10 barrels, but for shorter time than the first.

Scratched, with no benefit.

Third torpedo, May 8, 1872, 7 feet lower than the second. Slight increase in oil.

Fourth torpedo, July 13, 1872, 5 feet below top of 3d SS. and 2 feet above the point at which the first was exploded. Increased production, but did not pay for cost of torpedoing.

Abandoned August 2, 1872.

726. *Colorado Well, No. 7.*

Struck August 8, 1871.

Level of well mouth above ocean				
Drive pipe to rock	75	feet.	75	=
? (Interval unknown)	190	to	265	=
1st SS. (First Sandstone)	25	"	290	=
?	79	"	369	=
2d SS	15	"	384	=
?	86	"	470	=
3d SS	43	"	513	=
? pocket,	8	"	521	=

Wet hole. Cased at 386.

Mud vein 12 feet below top of 3d SS. Natural production, 7 barrels per day for a few days.

Third sand poor. From marks of oil on the tubing while the well was being pumped, it was inferred that the oil came in at a point in the sand rock just under the "mud vein," say from 12 to 15 feet below the top of the sand.

A three-pint nitro-glycerine torpedo was discharged at the point in the sandrock where the oil appeared to come in. The production rose at once to 40 barrels per day, but declined rapidly to 20 barrels, and then slowly to 17 barrels, at which figures it remained for more than three months, when it was flooded with water from well No. 10, then drilling within 15 rods of No. 7. When No. 10 was completed and tubed, and the water in it partially exhausted, this well, No. 7, began to recover its oil, but not in so large quantities as before it was flooded. From the time No. 10 began to pump oil, in January, 1872, until July of the same year, No. 7 slowly declined in production, and at the latter date was pumping only 2 barrels per day.

It was then torpedoed again at the same point as at first, after which it yielded, for a short time, 25 barrels per day and then declined rapidly to 4 barrels.

During the great "shut down movement of October, 1872," when all the walking beams in the oil regions were stopped for 30 days, this well lay idle. But on starting up again in November, it produced 40 barrels per day for three days. Seven days later it was producing 8 barrels, and at the end of one month had settled to its old production before the "shut down," say 4 barrels.

727. *Colorado Well, No.* 8.

Struck November, 1871.

Level of well mouth above ocean				
Casing to rock	10 feet.		10	=
? (Interval unknown)	268	to	278	=
1st SS. (First Sandstone)	30	"	308	≡
?	102	"	410	=
2d SS	20	"	430	=
?	85	"	515	=
3d SS	46	"	561	=
? pocket,	4	"	565	=

Drilled dry. The casing was first put in at 180 feet. Failing to shut off the fresh water, it was drawn and the large hole continued down to 278 feet. At this point it was cased again, but both fresh water and salt water came in below as the drill went down, and the casing had to be drawn the second time. The well was then reamed down to the second sand, and 432 feet of casing put in, after which the hole remained perfectly dry until the oil sand was reached.

The upper 20 feet of the 3d SS. was good. The lower (26 feet) was finer, of a grayish color and intermixed with white pebbles. When the 3d SS. was struck, gas came in very freely and the hole quickly filled up many feet with oil and salt water.

Natural production, 1½ barrels per day.

Torpedoed November 21, 1871, with 2 quarts of nitro-glycerine. Exploded 6 feet below top of 3d SS. Result, 7 barrels per day. Declined rapidly.

Torpedoed December 15, 1871, with 3 pints of nitro-glycerine. Exploded at top of 3d SS. Result not satisfactory.

Torpedoed May 2, 1872, with 1 quart nitro-glycerine. Exploded 15 feet below top of 3d SS. Result, slight improvement.

Abandoned November 7, 1872.

728. *Colorado Well, No.* 9.

November, 1871.

Level of well mouth above ocean					1514
Conductor to rock	18 feet.		18	=	1496
? (Interval unknown)	395	to	413	=	1101
1st SS. (First Sandstone)	28	"	441	=	1073
?	119	"	560	=	954
2d SS	25	"	585	=	929
?	77	"	662	=	852
3d SS.	48	"	710	=	804
? pocket,	6	"	716	=	798

Drilled dry. Cased at 417½ feet.

Sand generally good.

Natural production, about 3 barrels for a short time.

November 29, 1871. A 2 quart torpedo was used 11 feet below top of 3d SS. Result, 10 barrels per day at first, with rapid decline.

December 11. A 2 quart torpedo was exploded at 6 feet in the sand. Result not as satisfactory as from the first one. On May 21, 1872, the production had decreased to less than 2 barrels per day. A 3 pint torpedo was then put in 17 feet below the top of the sand. Production for the next 4 months, 4 barrels per day. After the "30 days' shut down" of October, 1872, it started to pump at less than 1 barrel per day, and with very little gas. This decline was attributed to the pumping of the wells on the adjoining tract after this one had been stopped.

November 26, 1872, it was treated with 6 volcanic burners, but with very slight improvement.

December 7, 1872, exploded a 3 pint torpedo 20 feet below the top of sand. Increase in oil very slight.

June 24, 1873. Production, half barrel per day.

729. *Colorado Well*, *No.* 10.

January 10, 1872.

Level of well mouth above ocean				
Drive pipe	42	feet.	42	=
? (Interval unknown)	198	to	240	—
1st SS. (First Sandstone)	40	"	280	—
?	89	"	369	=
2d SS	14	"	383	—
?	87	"	470	=
3d SS	43	"	513	—
? pocket,	9	"	522	=

Wet hole. Cased at 274 feet, 3¼ inch casing.

3d sand of ordinary quality.

Best part of it between 482 and 485 feet. This well when first pumped threw off a large quantity of fresh water, and then gradually changed to salt water. The first eight days of pumping the yield of oil did not exceed 3 barrels per day. On the tenth day it produced about 100 barrels of oil and an equal quantity of salt water. It continued to do the same with but very little variation for four months, after which it slowly declined to 60 barrels of oil and 60 barrels of salt water. It then declined rapidly to 28 barrels of oil and very little salt water. On the 27 of November, 1872, when the oil flow had declined to 23 barrels, the well was treated with 8 volcanic burners which increased the oil to 30 barrels per day, and also augmented the volume of water. After this, until about June 1, 1873, the production of oil fluctuated from 22 barrels to 36 barrels per day. It then suddenly declined to 12 barrels per day, with a very perceptible increase of salt water.

730. *Colorado Well*, No. 11.

January 20, 1872.

Level of well mouth above ocean				
Wooden conductor to rock	17	feet	17	—
?	380	to	397	=
1st SS	30	"	427	=
?	117	"	544	=
2d SS	25	"	569	=
?	76	"	645	=
3d SS	46	"	691	=
? pocket,	8½	"	699½	=

Drilled dry. Cased at 392½ feet.

3d sand good in every part, particularly so between 662 feet and 670 feet.

Natural production, 190 barrels daily for five days. Decreased rapidly to 130 barrels, and then more gradually until September 11, 1872, when it was pumping only 8 barrels. At this time a 3 pint torpedo was put in 18 feet below the top of the 3d SS., resulting in a daily production of 150 barrels for 3 days. It declined rapidly. On September 21, it had fallen to 24 barrels per day, and on January 1, 1873, to 4 barrels per day. A 3 pint torpedo was then used 12 feet in the sand, and the yield was thus brought up to 15 barrels per day for a short time.

Then commenced another rapid decline carrying the production down to 3 barrels per day by the 6th of May following, when another torpedo was inserted, resulting in a slight increase of oil.

On June 24, 1873, while pumping 4 barrels per day, an attempt was made to fill up the well by putting oil and water in at the top. After 275 pails full had been poured in, it was ascertained that it had only filled up the bottom of the 5½ inch well hole 25 feet.

731. *Colorado Well, No.* 12.

March, 1872.

Level of well mouth above ocean					1331
Drive pipe to rock	57	feet.	57	=	1274
? (Interval unknown)	198	to	255	=	1076
1st SS. (First Sandstone)	40	"	295	=	1036
?	90	"	385	=	946
2d SS	12	"	397	=	934
?	87	"	484	=	847
3d SS	48	"	532	=	799
? pocket,	13	"	545	=	786

Drilled dry. Cased at 220 feet.

Best part of oil sand from 492 feet to 504 feet. Oil came in while running the second "bit" after the 3d sand was struck.*

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*A "bit" is the technical term applied to the chisel-shaped tool used in drilling before the "reamer" or finishing tool is introduced. It is seldom "run" more than three feet without being withdrawn for sharpening. Oil struck "while running the second bit" means, therefore, that it was from three to five feet below the top of the sand rock.

Natural production, 80 barrels per day, when first struck, declining slowly to 7 barrels by the 20th of August, 1872, when a 3 pint torpedo was put in 10 feet below the top of 3d sand. The result was an increase to 60 barrels the first 24 hours, and a rapid decline to 10 barrels in 30 days. For two or three months after this it pumped steadily 10 barrels per day, and then began to decline. On May 24, 1873, it was yielding only 3 barrels per day. Another torpedo was now exploded at a point 14½ feet below the top of the 3d SS., bringing the production up to 30 barrels per day for two days, followed by a gradual decline to 10 barrels at the end of 30 days.

732. *Colorado Well, No.* 13.

July 20, 1872.

Level of well mouth above ocean				
Wooden conductor to rock	15 feet.		15	=
? (Interval unknown)	374	to	389	=
1st SS. (First Sandstone)	29	"	418	=
?	73	"	491	=
2d SS	19	"	510	=
?	98	"	608	=
3d SS	38	"	646	=
Sand and slate alternating	8	"	654	=
Slate	4	"	658	=

Drilled dry. Cased at 205 feet.

Best sand from 3 to 8 feet below the top of 3d SS. While drilling in this the well filled up rapidly.

Natural production, 3 barrels per day. July 26, exploded a 3 pint torpedo 5 feet below top of 3d SS., causing but little improvement in production.

August 2, 1872, exploded another 3 pint torpedo one foot higher in the sand. Increase slight. Five days after torpedoing the well was producing 5 barrels.

733. *Colorado Well, No.* 14.

August 1, 1872.

Level of well mouth above ocean				
Wooden conductor to rock	15 feet.		15	=
?	372	to	387	=
1st SS	23	"	410	=
?	106	"	516	=
2d SS	21	"	537	=
?	85	"	622	=
3d SS	45	"	667	=
? pocket,	8	"	675	=

Drilled dry. Cased at 275′.

Salt water and gas appeared in 2d SS. Third sand white and soft. Oil and salt water came in at a point 12 feet below its top. The best quality of sand was between 17 and 25 feet. Soft sand from 28 to 30 feet. Indications of a crevice between 38 and 40 feet.

Natural production, 2 barrels per day.

Aug. 10, 1872, torpedoed (3 pints) at 18 feet below top of sand. Production rose to 14 barrels per day, but declined in 10 days to 8 barrels. Then sank to 6 barrels. Pumped steadily 6 barrels per day for a long time, then slowly began to decline, and on the 26th of June, 1873, it was pumping less than 1 barrel per day.

734. *Colorado Well, No.* 15.

August 25, 1872.

Level of well mouth above ocean				
Wooden conductor to rock	14	feet.	14	=
? (Interval unknown)	306	to	320	=
1st SS. (First Sandstone)	27	"	347	=
?	83	"	430	=
2d SS	20	"	450	=
?	97	"	547	=
3d SS	38½	"	585½	=
? pocket,	13½	"	599	=

Drilled dry. Cased at 173′.

Considerable gas in 2d SS.

Softest part of 3d SS. commenced at 3½ feet below its top, and continued down to 7 feet. At this point there was a large amount of gas, and the well filled rapidly with fluid, the larger portion of it being salt water. From 14 to 18 feet below the top of the sand, the composition of the rock was such as to warrant the expectation of a good well, but there was so much fluid in the hole at this time that it could not be positively ascertained whether oil came in at this point or not.

Natural production, 1½ barrels per day.

Aug. 29, 1872, torpedoed (3 pints) at 5 feet below top of 3d sand. Production first 24 hours thereafter, 12 barrels; and ten days later, 10 barrels per day.

Nov. 18, 1872, exploded a torpedo shell filled with giant powder, said to equal in strength a 3 pint nitro-glycerine torpedo. Before torpedoing the well was pumping 5 barrels per day. Four days afterwards, it was producing 6 barrels per day. The explosion filled up the well hole 10 feet. [Meaning, no doubt, with the crushed and broken fragments of the sandrock.]

This well declined very slowly, and on June 24, 1873, was pumping 1⅔ barrels per day.

735. *Colorado Well, No.* 16.

November 6, 1872.

Level of well mouth above ocean				
Wooden conductor to rock	14 feet.		14	=
? (Interval unknown)	406	to	420	=
1st SS. (First Sandstone)	20	"	440	=
?	91	"	531	=
2d SS	19	"	550	=
?	107	"	657	=
3d SS	36	"	693	=
? pocket,	14	"	707	=

Drilled dry. Cased at 257½′.

Very small quantity of gas and salt water in 2d SS.

Small quantity of salt water came in at the top of 3d SS. Oil came in from 7 to 10 feet below the top. Sand good down to 14 feet. Good again from 20 to 23 feet. Below 23 feet it was fine and hard, but white, until near the bottom.

Natural production, about 4 barrels of oil and 7 barrels of salt water per day.

Nov. 14, torpedoed (3 pints) 9 feet below top of 3d SS., it then produced 7 barrels of oil per day for about 10 days.

May 17, 1873, pumping 1½ barrels per day. Torpedoed 20 feet below top of sand. Increased to 3 barrels per day for a short time.

June 24, 1873, pumping 1½ barrels per day, and continued to do so until October, 17, 1873. Flooded with 7 barrels of benzine, but slight increase either in gas or oil.

Nov. 16, 1873, pumping 2 barrels per day.

736. *Colorado Well, No.* 17.

November 23, 1872.

Level of well mouth above ocean				
Wooden conductor to rock	13 feet.		13	=
?	396	to	409	=
1st SS	21	"	430	=

?......................................	101	to	531	=
2d SS....................................	19	"	550	=
?......................................	89	"	639	=
3d SS....... ....(not through SS.)	40	"	679	=

Drilled dry. Cased at 237′.

Oil came in in small quantities while running the first "bit" in the 3d SS. First show of salt water about 14 feet below top of sand. Sand soft and white down to 27 feet, then began to change to gray. From 31 feet to 40 feet it was very poor.

Natural production, 1¼ barrels per day. Torpedoed December 3, 1872, (3 pints,) 14 feet below top of 3d SS., and 48 hours afterward it was producing at the rate of 10 barrels per day.

The well declined very slowly, and on the 26th of June, 1873, it was still producing 4 barrels per day.

737. *Colorado Well, No.* 18.

January 25, 1873.

Level of well above ocean..				
Wooden conductor to rock.....................	15	feet.	15	=
Interval, containing 1st and 2d SS.............	578	to	593	=
3d SS. (Third Sandstone)	45	"	638	=
? (Interval unknown) .... pocket,	11	"	649	=

Drilled dry. Cased at 275 feet.

But little salt water and no oil came into the well until the drill had penetrated the 3d SS. about 14 feet; here both oil and salt water came in, filling up the hole 75 feet or more. The best and softest part of the 3d SS. was from 21 to 28 feet below the top of the rock.

Natural production, less than one-half a barrel per day.

Torpedoed February 26, 1873, (3 pints,) 14 feet below top of 3d SS. Production brought up to 2 barrels of oil and 10 or 12 barrels of salt water per day. Pumped about four weeks at this rate, then commenced to increase in oil and decrease in salt water, and in ten days was pumping 24 barrels of oil per day. Pumped at this rate for ten or twelve days, then gradually declined, and four months after torpedoing, was pumping 9 barrels daily.

738. *Colorado Well, No.* 19.

February 19, 1875.

Level of well mouth above ocean			
Wooden conductor to rock	15	feet.	15 =
Interval containing 1st and 2d SS	514	to	529 =
3d SS. (Third Sandstone)	42	"	571 =
? (Interval unknown)	9½	"	580½ =

Drilled dry. Cased at 181 feet.

3d SS. hard on top, but at the depth of 5 feet changed for the better, and some oil and salt water came in. Rock remained quite close until the drill had gone down 13 feet in the sand when it became softer, but still there was no perceptible increase of fluid in the hole. From 13 feet down to 22 feet the sand was rather soft, and remained good down to 33 feet, from which downward it gradually grew finer and harder.

Natural production, about 1½ barrels of oil and 12 to 15 barrels of salt water per day.

February 22, 1876, torpedoed (3 pints) 14 feet below top of 3d SS. After torpedoing it commenced to pump at the rate of 15 barrels per day, and increased gradually, and on

March	1,	it was	pumping	30	barrels	per day.
"	20,	"	"	34	"	"
April	1,	"	"	28	"	"
"	8,	"	"	30	"	"
May	10,	"	"	20	"	"

739. *Colorado Well, No.* 20

April 11, 1876.

Level of well mouth above ocean			
Drive pipe to rock	41	feet.	41 =
Interval, containing 1st and 2d SS	455	to	496 =
3d SS	44	"	540 =
? pocket,	10	"	550 =

Drilled dry. Cased at 159 feet.

Softest part of 3d SS. from 5 to 18 feet below the top. Oil began to come in with a very little salt water while drilling between 5 and 8 feet. Quite an increase of salt water at 24 feet. Gradual increase of gas all the way from 5 to 25 feet. Sand very hard at 39 feet, but good at the bottom of the rock.

Natural production, 2½ barrels of oil, with about 8 barrels of salt water per day.

April 21, 1876, torpedoed (3 pints) 8½ feet below top of 3d SS. Production during the first 24 hours thereafter, 7 barrels of oil, with not much increase of salt water and a small increase of gas.

May 10, 1876, pumping 6 barrels of oil per day.

740. *Colorado Well, No.* 21.

June 7, 1876.

Level of well mouth above ocean			
Wooden conductor to rock	10 feet.	10	=
Stove pipe casing*	14 "	14	=
Interval, containing 1st and 2d SS	614 "	628	=
3d SS. (Third Sandstone)	41 "	669	=
? (Interval unknown) pocket,	10 "	679	=

Drilled dry. Cased at 249 feet.

The softest and best part of the 3d SS. commenced at 2 feet below its top and continued down to 8 feet. Here oil and gas and salt water came into the hole. The sand was quite soft until the rock had been penetrated 30 feet, after this it was very hard until quite near the bottom, where it was found to be soft and coarse.

Natural production, about 5 barrels of oil with 10 barrels of water during the first 24 hours. Three days later it was pumping 6 barrels of oil.

June 18, 1876, pumping about 5½ barrels of oil.

June 20, 1876, torpedoed (3 pints) 6 feet below top of sand. Result, 15 barrels at first, gradually running down to 8½ by Nov. 25.

741. *Magnolia, No.* 1.

Struck June, 1872.

Located on Ware farm, Colorado district.

Level of well mouth above ocean			
?	438 to	438	=
1st SS	30 "	468	=

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* Sometimes the conductor is not properly driven to the rock. The drilling commences, and after going down some distance it is discovered that the loose material is falling in at its bottom. When the "cave" is not very serious a common, riveted, sheet iron "stove-pipe" cylinder is shoved down to prevent its enlargement. This casing is merely a supplement or lining to the conductor, and represents what should have been the length of the conductor had it properly been put in originally.

?	122	to	590	=
2d SS	10	"	600	=
?	82	"	682	=
3d SS.	43	"	725	=
?.. pocket,	10	"	735	=

Drilled dry. Cased at 286′.

Show of oil at 688′ and gas at 696′.

3d SS. rather dark and close.

Production, after one torpedo, about 2 barrels per day.

Pumped at intervals until January, 1873.

742. *Magnolia, No.* 2.

Struck July 7, 1873.

Ware farm, Colorado district.

Level of well mouth above ocean					1621
7⅝-inch casing to rock	61 feet.		61	=	1560
? (Interval unknown)	691	to	752	=	869
3d SS. (Third Sandstone)	42	"	794	=	827
Slate	1	"	795	=	826
Very hard shell	5	"	800	=	821
? pocket,	5	"	805	=	816

Drilled dry. Cased at 350′.

Best and softest part of 3d SS. from near the top down to 12 feet. Good sand all the way down to 30 feet. Oil came in while drilling, but could not tell at what point, on account of the accumulation of salt water in the hole, coming down from the 2d SS.

Natural production, between 3 and 4 barrels per day.

July 9, 1873, torpedoed (3 pints) 7 feet below top of 3d SS. Produced about 11 barrels the next 24 hours.

July 12, torpedoed (3 pints) 12 feet below top of rock. No increase.

743. *Chick Well, No.* 1.

January, 1872.

Colorado district.

Level of well mouth above ocean				
?	598	to	598	=
2d SS	19	"	617	=
?	85	"	702	=
3d SS	34	"	736	=
? pocket,	25	"	761	=

"Measured by the drillers; probably incorrect."

Cased with 5⅜" casing, but failed to shut off the water. Afterwards cased with 3¼" casing to depth of 450 feet.

3d SS. about 43 feet thick. Close and dark. Best part of it from 717 to 720 feet. Fair at 734 feet.

Natural production, less than 1 barrel per day.

Torpedoed at 705 feet and 717½ feet. Increased to about 3 barrels per day. The well was pumped by heads, and in January, 1873, produced about 2 barrels per day.

744. *Chick Well, No.* 2.

November 15, 1873.

Colorado District.

Level of well mouth above ocean				
? (Interval unknown)	0	to	734	=
3d SS. (Third Sandstone)	45	"	779	=

Drilled dry. Cased at ——.

Mud vein 5 feet below top of 3d SS. Sand soft at top. Very good between 12 feet and 20 feet. Salt water at 24 feet.

The well filled up with oil about 200 feet before the salt water vein was struck.

Natural production, about 10 barrels per day.

Dec. 3, 1873, torpedoed 13 feet below top of 3d SS. Production increased to 60 barrels per day. Declined gradually to 15 barrels by Feb. 15, 1874.

Torpedoed a second time, resulting in a slight increase of oil for a short time.

745. *Chick Well, No.* 3.

February 13, 1873.

Colorado district.

Level of well mouth above ocean				
Wooden conductor to rock	20 feet.		20	=
?	736	to	756	=
3d SS	52	"	808	=
? pocket,	14	"	822	=

Drilled dry. Cased at 378 feet.

Strong flow of gas and oil when 3d SS. was first struck, and the well filled up nearly 300 feet with oil.

Mud vein about 5 feet below top of 3d SS. Sandrock rather ordinary for the first 25 feet, below that point quite hard, and at the bottom gray and dark. Softer than usual at 17 feet below the top. Salt water appeared between 25 and 30 feet below the top of sand.

Natural production, 75 barrels of oil and 100 barrels of salt water per day.

June 25, 1873, the production was 25 barrels per day.

746. *Potter Well*, *No.* 1.

February, 3, 1873.

Colorado District.

Level of well mouth above ocean				
Wooden conductor to rock	**25 feet.**	**25**	=	
? (Interval unknown)	**645½ to**	**670½**	=	
3d SS. (Third Sandstone)	**47 "**	**717½**	=	
? pocket,	**12½ "**	**730**	=	

Drilled dry. Cased at 266 feet.

3d SS. good from top to bottom. Soft at 6 feet. Also from 12 to 15 feet, and extra quality at 42 feet. The lower part of the sand was softer than the upper, which is not generally the case in this locality.

The well filled up with fluid nearly 300 feet while drilling, but it was mostly composed of salt water.

Natural production, about 3 barrels of oil and 12 barrels of salt water per day.

February 5, torpedoed 12 feet below top of 3d SS. Bottom of hole filled up 1 foot with sand. Result, 12 barrels of oil and 50 barrels of salt water per day at first, declining to 6 barrels of oil in four days.

February 10, torpedoed 6 feet below top of sand. Well filled up with sand 4 feet. Production slightly increased for a short time.

March 12, treated the well with 10 volcanic burners. But slight improvement.

April 2, torpedoed 21 feet below top of sand. No benefit.

April 21, 1873, abandoned the well.

747. *Potter Well*, *No.* 2.

February 11, 1872.

Colorado District.

Well mouth above ocean				**1556**
Wooden conductor	**15 feet.**	**15**	=	**1541**

?	663	to	678	=	878
3d SS	50	"	728	=	828
? pocket,	16	"	744	=	812

Drilled dry. Cased at 264 feet.

The 3d SS. was good all the way through. Uncommonly so, for the first 20 feet, at which depth there was a good show of oil and gas. Below 25 feet the sand was somewhat harder and finer.

Natural production, less than one barrel of oil and 8 or 9 barrels of salt water per day.

February 13, torpedoed 20 feet below top of 3d SS. The well filled up with sand 5 feet. Results, good. An increase both in oil and salt water. After several days' delay in getting the well to work, it pumped, when first started up, 16 barrels of oil and 100 barrels of salt water per day

March 18, treated it with 10 volcanics. Results, an increase of gas and slight increase of oil.

June 20, 1873, it was pumping 9 barrels of oil and 18 barrels of salt water.

748. *Pottcr Well, No.* 3.

March 21, 1873.

Colorado District.

Well mouth above ocean					1555
Wooden conductor to rock	16 feet.		16	=	1539
? (Interval unknown)	661	to	677	=	878
3d SS. (Third Sandstone)	50	"	727	=	828
? pocket,	8	"	735	=	820

Drilled dry. Cased at 270 feet.

The 3d SS. was good throughout its entire thickness, soft for the first 24 feet, then somewhat harder, but not very hard in any part.

Natural production, 2 barrels of oil and 6 or 8 barrels of salt water per day.

April 9, torpedoed, (3 pint shell,) production increased to 15 barrels of oil per day. Sustained the yield at this point for some time and then slowly declined to 8 barrels by the 20th of June following.

749. *Potter Well, No. 4.*

March 21, 1873.

Colorado District.

Level of well mouth above ocean		
Wooden conductor to rock	19 feet.	19
? (Interval unknown)	637 to	656
3d SS. (Third Sandstone)	47 "	703
? pocket,	10½ "	713½

Drilled dry. Cased at 255 feet.

3d SS. very uneven. Upper 13 feet soft; next 3 feet very hard; then 3 or 4 feet of soft sand. Below this finer and more even in composition.

Natural production, 1 barrel of oil and 15 or 20 barrels of salt water per day.

March 26, torpedoed (3 pint shell) 16 feet below top of 3d SS. Results, an increase to 4 or 5 barrels of oil and 100 barrels of salt water per day. Pumped in this way for some time and then gradually increased in oil until it produced 8 barrels per day. A decline then commenced both in oil and salt water. On June 24, 1873, it had settled back to 5 barrels of oil per day, and on August 6, to 3 barrels per day. At this time it was torpedoed again, and the next day was pumping at the rate of 8 barrels of oil per day.

On the 21st of August it had run down to 4 barrels per day, with a slight increase in the volume of gas. From this time it gradually declined to 1 barrel per day where it remained for two or three months.

Jan. 22, 1874, flooded sandrock with benzine, with no improvement either to oil or gas.

Jan. 28, put in one of Quick & Fertig's injectors.* After the first two injections the production rose to 2½ barrels, increasing to 5 barrels by the end of one week from the time the injector was put in. Benzine was used in the injector; and a gradual increase in production occurred until on July 24, 1874, the well was pumping 17 barrels of oil per day.

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*The "injector" is a patented device by which perforations made in the tubing just above the pump chamber can be opened and closed at pleasure by the "sucker rods." Benzine is poured in at the top of the well and the pump kept in motion until the oil in the well and tubing is pumped out and benzine begins to show at the delivery pipe. The tubing is now full of benzine and the well is empty, or nearly so. On opening the apertures in the injector, the 500 or 1,000 feet of benzine in the tubing forces out strong jets in all directions against the walls of the well washing them down with force and giving more satisfactory results than can be obtained by a simple "flooding" with benzine. The process may be repeated again and again until the desired effect is produced.

750. *Potter Well, No.* 5.

April 4, 1873.

Colorado district.

Level of well mouth above ocean				
Wooden conductor to rock	16 feet.		16	=
? (Interval unknown)	655	to	671	=
3d SS. (Third Sandstone)	46	"	717	=
? pocket,	11	"	728	=

Drilled dry. Cased at ——.

3d SS. good. Upper 35 feet white and soft, then 5 feet of gray, and remaining 6 feet white but hard.

Natural production, 2 barrels of oil and 8 to 10 barrels of salt water per day.

April 8. Torpedoed and brought the production up to 140 barrels of oil per day, but it rapidly declined to 16 barrels, and on June 24 had still further declined to 12 barrels per day. It never pumped much salt water.

751. *Potter Well, No.* 6.

June 4, 1873.

Colorado district.

Level of well mouth above ocean				
Wooden conductor to rock	18 feet.		18	=
?	639	to	657	=
3d SS	46	"	703	=
? pocket,	12	"	715	=

Drilled dry. Cased at 240′.

3d SS. good to the depth of 32 feet, below that finer and not so white.

Oil came in near top of sand, and salt water 4 feet below the top.

Natural production, 2 barrels of oil with 6 or 8 barrels of salt water per day.

June 6, torpedoed and increased the production to 150 barrels of oil daily. Declined in fourteen days to 36 barrels daily.

June 28, 1875, torpedoed 6 feet below top of 3d SS. Result, 3½ barrels per day.

752. *Potter Well, No.* 7.

July 11, 1873.

Colorado district.

Level of well mouth above ocean			
Wooden conductor to rock	16 feet.	16	=
? (Interval unknown)	629 to	645	=
3d SS. (Third Sandstone)	46 "	691	=
? pocket,	13 "	704	=

Drilled dry. Cased at 229′.

3d SS. very soft the first 12 feet, soft the next 14 feet and then harder and not so good as the drill approached the bottom. The well filled up with oil very fast after the sand was struck and while the first "bit" was being run in it.

Natural production, 8 barrels per day.

July 14, torpedoed (3 pint shell) 6½ feet below top of 3d SS. Result, a production of 100 barrels of oil per day.

Nov. 20 1874, production down to two-thirds of a barrel per day. Torpedoed (giant powder) 7½ feet below top of sand. No increase in gas and very little in oil.

From July 1876, until the 11th of October following, this well produced 2 barrels per day, and then, without any treatment whatever, began to increase. On October 25 it was producing 5½ barrels, November 10, 6⅔ barrels, and November 25, 5½ barrels.

753. *Potter Well, No.* 8.

April 27, 1876.

Colorado district.

Level of well mouth above ocean			
Wooden conductor to rock	15 feet.	15	=
?	616 to	631	=
3d SS	47 "	678	=
? pocket,	10 "	688	=

Drilled dry. Cased at 225′.

3d SS. first 4 feet very hard, next 8 feet very soft; then 9 feet a little firmer but not hard; then 10 feet softer; the remaining 16 feet being about an average sand. The first show of oil was at 21 feet below the top of the sand. Very little salt water and gas came into the hole while drilling, and when the well was tubed there was not more than 20 feet of fluid in it.

Natural production, less than ¼ of a barrel of oil with about 5 barrels of salt water per day.

The first torpedo exploded 18 feet below top of sand increased the salt water slightly, but not the oil and gas.

May 8. Second torpedo (3 pint shell) 6 feet below top of sand. No improvement.

May 11. Employed the scratcher. No improvement.

May 12. Torpedoed 30 feet below top of sand. No increase either in oil or gas.

June 6. Put in Quick & Fertig's injector. Still no improvement.

The well was abandoned June 22, 1876, after having been pumped steadily for nearly two months.

754. *Darling Well.*

Drilled in 1865.

Gilson Run, Warren County.

Level of well mouth above ocean			
Drive pipe		57½	feet.
Soft slate	at	70	"
Very hard slate and 3-inch crevice	"	78	"
20 inch of salt water	"	145	"
Soft slate, 15 inch crevice	"	175	"
Very fine sandrock	"	185	"
12 inch crevice	"	230	"
Some oil, 15 inch crevice	"	290	"
Bottom of sandrock	"	310	"
Grey sandrock	"	355	"
Water course carrying away everything from the well	"	373	"
Some oil, 15 inch crevice	"	399	"
Fine white sand	"	411	"
Bottom of sand	"	426	"
Flint and slate	"	450	"
Top of sandrock	"	514	"
Coarse white pebble sand, 6 inch crevice	"	522	"
Pebble rock and bottom of well	"	541	"

This well was never cased. The water was shut off by seed bag on tubing. It was pumped some time, producing several barrels of oil which is supposed to have come from the 2d SS

755. *Clifton Well, No.* 1.

April, 1872.

Colorado district, south-east corner of tract 200.

Level of well mouth above ocean in feet........................				
? (Interval unknown)	0	to	402	=
1st SS. (First Sandstone) estimated....	20	"	422	=
?..	123	"	545	–
2d SS..	19	"	564	=
?..	84	"	648	–
3d SS..	42	"	690	=

Drilled dry. Cased at 264′.

Very poor sand. Well never tubed.

756. *Eclipse Well.*

Colorado district.

Level of well mouth above ocean				
6¼-inch casing to rock	48 feet.		48	–
Mountain sand..	162	to	210	–
?..	240	"	450	=
1st SS. (estimated)..	20	"	470	=
?..	55	"	525	=
2d SS. (estimated)..	10	"	535	=
?..	45	"	580	=
3d SS. (estimated)..	20	"	600	=
?..	76	"	676	=
4th SS	29	"	705	=
?.. pocket,	12	"	717	=

757. *Cadwell Well.*

Hill farm, Colorado district.

Level of well mouth above ocean				
6¼-inch casing to rock..	36	to	36	=
?..	230	"	266	=
1st SS..	29	"	295	=
?..	105	"	400	=
2d SS..	18	"	418	–
?..	83	"	501	–
3d SS..	46	"	547	=
?.. pocket,	4	"	551	=

Wet hole. Cased (3¼ inch) at 275′.

Abandoned December 30, 1875.

758. *Onondaga Well.*

East of Enterprise, Colorado district.

Level of well mouth above ocean				
Drive pipe	62	feet.	62	=
? (Interval unknown)	137	to	199	=
SS. (Sandstone,) gray	25(?)	"	224	=
?	236	"	455	=
2d SS	15	"	470	=
?	51	"	521	=
3d SS	13	"	534	=
?	36	"	570	=
4th SS	15	"	585	=
?	90	"	675	=
5th SS	26	"	701	=
Soft measures. No sandstone	99	"	800	=

GROUP 2.

ENTERPRISE, WARREN COUNTY.

Benedict Estate Wells, copied from office records.

759. *Benedict Estate Well, No*. 1.

Level of well mouth above ocean				
?	192	to	192	=
1st SS	50	"	242	=
?	58	"	300	=
2d SS	4	"	304	=
?	31	"	335	=
3d SS	10	"	345	=
?	117	"	462	=
4th SS	15	"	477	=

760. *Willard Well, No*. 1.

Level of well mouth above ocean				
Upper measures not noted	443	to	443	=
3d SS	25	"	468	=

761. *Harvey Well, No*. 1.

Level of well mouth above ocean				
?	180	feet.	180	=
1st SS	49	to	229	=
?	71	"	300	=
2d SS	6	"	306	=

?	16	to	322	=
3d SS	12	“	334	=
?	95	“	429	=
4th SS	6	“	435	=
?	14	“	449	=
5th SS., oil	15	“	464	=

762. *M'Kinney Well, No.* 1.

Level of well mouth above ocean				
Upper measures not noted	441	to	441	=
3d SS	21	“	462	=

763. *Reed Well.*

Adjoining Benedict estate. Record from memory of driller.

Level of well mouth above ocean				
? (Interval unknown)	150 feet.		150	=
1st SS. (First Sandstone)	52	to	202	=
Slate, blue	118	“	320	=
2d SS	14	“	334	=
SS., hard, gray	12	“	346	=
Slate, black	99	“	445	=
Stray SS., gray	12	“	457	=
Slate	12	“	469	=
3d SS [doubtful whether 12 or 22]	22	“	491?	=

GROUP 3.

DENNIS RUN.

Wells of the Tidioute and Warren Oil Co., on Dennis Run, between Triumph and Tidioute. Records furnished by Major Cushing, of Tidioute.

764. *Lease No* 58, *Well No.* 1.

Well mouth above ocean					(?) 1236
?	45	to	45	=	1191
1st SS	30(?)	“	75?	=	1161
?	62	“	137	=	1099
2d SS	25(?)	“	162?	=	1074
?	133	“	295	=	941
Stray SS	47	“	342	=	894
? pocket,	8	“	350	=	886
Depth of well					

765. *Well No.* 2.

Level of well mouth above ocean				
? (Interval unknown)	124	to	124	=
1st SS. (First Sandstone)	29	"	153	=
?	63	"	216	=
2d SS	28	"	244	=
?	26	"	270	=
Stray SS	16	"	286	=
?	90	"	376	=
3d SS	48	"	424	=

766. *Well No.* 3.

Level of well mouth above ocean				
?	180	to	180	=
1st SS	30	"	210	=
?	60	"	270	=
2d SS	35	"	305	=
?	35	"	340	=
Stray SS	25	"	365	=
?	60	"	425	=
3d SS	50	"	475	=

At 436 first show of oil; at 445 second show of oil.

767. *Well No.* 4.

Level of well mouth above ocean				
?	320	to	320	=
1st SS	35	"	355	=
?	55	"	410	=
2d SS	35	"	445	=
?	27	"	472	=
Stray SS	13	"	485	=
?	82	"	567	=
3d SS	27	"	594	=

768. *Well No.* 5.

Level of well mouth above ocean				
?	332	to	332	=
1st SS	47	"	379	=
?	44	"	423	=
2d SS	35	"	458	=
?	29	"	487	=
Stray SS	13	"	500	=
?	84	"	584	=
3d SS	48	"	632	=

GROUP 4.

TRIUMPH, WARREN COUNTY.

Wells of the Triumph Oil Co. Records from the Books in Office of Company.

769. *Well No.* 23.

Level of well mouth above ocean					
?		660	to	660	=
3d SS. 79 feet.	Fine hard sand	30	"	690	=
	Medium "	13	"	703	=
	Good "	17	"	720	=
	Pebble (crevice at 722½)	10	"	730	=
	Good sand	9	"	739	=

770. *Well No.* 101.

Level of well mouth above ocean				
? (Interval unknown)	662	to	662	=
3d SS. (First Sandstone)	88	"	750	=
? pocket,	6	"	756	=

Sand very good.

771. *Well No.* 146.

Level of well mouth above ocean				
?	694	to	694	=
3d SS	96	"	790	=

Coarsest from 764′ to 774′.

Salt water at 773′.

772. *Well No.* 148.

Level of well mouth above ocean				
?	712	to	712	=
3d SS	103	"	815	=

Coarsest sand at 795′.

Mud vein at 732′, 765′ and 785′.

773. *Well No.* 149.

On highest point of hill.

Level of well mouth above ocean				
?	729	to	729	=

3d SS. 74 feet.	Pebble	2	to	731	=
	Coarse sand	1	"	732	=
	Medium sand	2	"	734	=
	Pebble	20	"	754	=
	Coarse sand	10	"	764	=
	Pebble	20	"	784	=
	Coarse sand	12	"	796	=
	Pebble	4	"	800	=
Medium sand		3	"	803	=
?	pocket,	6	"	809	=

774. *Well No.* 152. *B.*

Level of well mouth above ocean				
? Interval unknown)	712	"	712	=
3d SS. (Third Sandstone)	90	"	802	=
? pocket,	3	"	805	=

Upper 60 feet fine.

Lower 30 feet coarse.

775. *Well No.* 224.

Level of well mouth above ocean				
?	675	to	675	=
3d SS	107	"	782	=
? pocket,	3	"	785	=

Good sand at 759′.

Pebble at 782′.

776. *Well No.* 237.

Level of well mouth above ocean					
?		667	to	667	=
3d SS. 106 feet.	Fine sand	56	"	723	=
	Very coarse pebble	20	"	743	=
	Fine sand	10	"	753	=
	Grayish pebble	20	"	773	=
?	pocket,	3	"	776	=

Mud at 701′ and 710′.

Salt water at 747′.

777. *Rising Sun Well.*

Dennis run. From S. Minor.

Level of well mouth above ocean				
?	104	"	104	=
1st SS	80	"	184	=
?	61	"	195	=
2d SS	28	"	223	=
?	117	"	340	=
3d SS	28	"	368	=

There was a gray rock about 20 feet below the 2d SS., and sometimes 25 feet thick. All the rocks were very hard.

GROUP 5.

DENNIS RUN.

Wells of J. & E. W. Parshall, on tract of N. Y. and Allegheny Oil Co., Dennis run, near Tidioute. Furnished by Mr. Parshall.

778. *Well No.* 4.

Level of well mouth above ocean				
- ? (Interval unknown)	320	to	320	=
1st SS. (First Sandstone)......(estimated)	30	"	350	=
?...(including 2d SS.)	230	"	580	=
3d SS	36	"	616	=
?... pocket,	5	"	621	=

779. *Well No.* 5.

Level of well mouth above ocean				
?	330	to	330	=
1st SS. (estimated)	30	"	360	=
?... (including 2d SS.)	230	"	590	=
3d SS	40	"	630	=

780. *Well No.* 7.

Level of well mouth above ocean				
?	240	to	240	=
1st SS. (estimated)	30	"	270	=
?... (including 2d SS.)	222	"	492	=
3d SS	50	"	542	=
?... pocket,	5	"	547	=

781. *Well No.* 9.

Level of well mouth above ocean				
?...(including 1st SS.)	301	to	301	=
2d SS. (estimated)	25	"	326	=
?	115	"	441	=
3d SS	66	"	507	=
?... pocket,	6	"	513	=

782. *Well No.* 10.

Level of well mouth above ocean................................				
? (Interval unknown)........................	224	to	224	=
1st SS. (First Sandstone)...... (estimated)....	30	“	254	=
?.......................(including 2d SS.)	208	“	462	=
3d SS..	69	“	531	=
?.................................. pocket,	23	“	554	=

783. *Well No.* 12.

Level of well mouth above ocean................................				
?..	255	to	255	=
1st SS. (estimated).........................	30	“	285	=
?.......................(including 2d SS.)	233	“	518	=
3d SS..	82	“	600	=
?.................................. pocket,	20	“	620	=

GROUP 6.

DENNIS RUN.

E. W. Parshall's Wells on the Dennis Run Tract.

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784. *Well No.* 1.

Level of well mouth above ocean................................				
?..	110	to	110	=
Mountain SS..................................	37	“	147	=
?..	151	“	298	=
1st SS..	43	“	341	=
?..	89	“	430	=
2d SS..	30	“	460	=
?..	91	“	551	=
3d SS..	36	“	587	=
?..	15	“	602	=

785. *Well No.* 2.

Level of well mouth above ocean................................				
?..	73	to	73	=
Mountain SS., estimated......................	35	“	108	=
?..	153	“	261	=
1st SS., estimated...........................	40	“	301	=

?	88	to	389	=
2d SS., estimated	30	"	419	=
?	95	"	514	=
3d SS	50	"	564	=

786. *Well No.* 3.

Level of well mouth above ocean				
? (Interval unknown) including Mount'n SS.,	274	to	274'	=
1st SS. (First Sandstone)	32	"	306	=
? including 2d SS.,	221	"	527	=
3d SS	50	"	577	=

GROUP 7.

TIDIOUTE.

Richardson, Tidioute. East side of Allegheny river. From Messrs. Rallston & Harrington.

787. *Well No.* 1.

Situated half way down the hill.

Level of well mouth above ocean				
?	84	to	84	=
1st SS	24	"	108	=
?	29	"	137	=
2d SS	23	"	160	=
?	76	"	236	=
3d SS	9	"	245	=

788. *Well No.* 2.

Up the hill.

Level of well mouth above ocean				
?	310	to	310	=
1st SS	20	"	330	=
?	24	"	354	=
2d SS	24	"	378	=
?	71	"	449	=
3d SS	11	"	460	=

GROUP 8.

OIL CREEK.

The following condensed tabular statements of the Columbia Farm (old "Story Farm") oil wells are valuable for their completeness and high authority, being furnished by the officers of the company with a full understanding of their scientific and practical value.

The data embraced in this table will be discussed in the Report of Progress, I.I.I., 1877.

No columns of elevation above tide, nor even of relative levels of the well mouths to each other can be given here, because the connection has not been made with the spirit level. But this will not prevent the reader from constructing his own diagrams showing the variability of the sand rocks and of the intervals between them.

Were the data given to correlate all the geological features of this important group of wells, a flood of light would be thrown upon some of the gravest questions connected with the oil deposits. It is to be greatly regretted that each one of the wells of such a group had not been studied by a geologist at the time when it was bored. Most of the facts essential to a right understanding of the subject were ignored because undervalued, and are forever lost.

Columbia Farm (Old Story Farm) on Oil Creek, one mile below Columbia

	NAME OF WELL.	Depth of conductor......	Rock interval.	FIRST SAND.			Rock interval.	SECOND SAND.		
				Top......		Bottom..		Top......		Bottom..
789	Babcock...........	36	304	340	50	390	52	442	25	467
790	Stewart...........	18	276	294	39	333	103	436	26	462
791	Reiter.............	18	399	417	47	464	74	588	25	563
792	Jones..............	27	292	319	37	356	105	461	24	485
793	Blocher...........	30	207	237	28	265	105	370	23	393
794	No. 58.............	27	313	340	33	373	72	445	36	481
795	No. 59.............	18	282	300	19	319	124	443	21	464
796	No. 61.............	21	458	479	21	500	101	601	23	624
797	No. 62.............	27	470	497	32	529	73	602	34	636
798	No. 64.............	27	498	525	30	555	82	637	33	670
799	No. 66.............	18	518	536	31	567	101	668	23	691
800	No. 69.............	24	528	552	27	579	85	664	31	695
801	No. 70.............	24	146	170	29	199	111	310	27	337
802	No. 71.............	27	502	529	44	573	107	680	20	700
803	No. 72.............	18	272	290	35	325	105	430	40	470
804	No. 73.............	18	262	280	35	315	102	417	18	435
805	No. 74.............	18	257	275	30	305	105	410	27	437
806	No. 77.............	36	483	519	42	561	97	658	22	680
807	No. 78.............	18	487	505	25	530	123	653	22	675
808	No. 80.............	27	525	552	35	587	107	694	24	718
809	No. 81.............	18	322	340	45	385	100	485	30	515
810	No. 82.............	18	312	330	40	370	115	485	25	510
811	No. 85.............	27	258	285	55	340	95	435	20	455
812	No. 86.............	36	304	340	50	390	85	475	25	500
813	No. 87.............	45	315	360	32	392	98	490	24	514
814	No. 89.............	18	262	280	30	310	135	445	24	469
815	No. 90.............	18	287	305	50	355	105	460	20	480
816	No. 91.............	18	269	287	57	344	115	459	22	481
817	No. 94.............	54	171	225	20	245	120	365	33	398
818	No. 96.............	18	382	400	40	440	85	525	39	564
819	No. 97.............	45	290	335	50	385	103	488	20	508
820	No. 99.............	27	508	535	45	580	105	685	20	705
821	No. 100...........	27	375	402	53	455	84	539	15	554
822	No. 101...........	26	354	380	50	430	101	531	24	555
823	No. 103...........	27	283	310	40	350	90	440	41	481
824	No. 104...........	27	438	465	50	515	92	607	24	631
825	No. 105...........	18	339	357	53	410	90	500	27	527
826	No. 106...........	27	482	509	50	559	100	659	25	684
827	No. 107...........	27	281	308	40	348	102	450	26	476
828	No. 108...........	18	527	545	31	576	103	679	72	751
829	No. 109...........	9	521	530	40	570	110	680	30	710
830	No. 110...........	36	464	500	37	537	143	680	20	700
831	No. 111...........	18	350	368	47	415	92	507	55	562
832	No. 112...........	27	313	340	35	375	80	455	35	490
833	No. 113...........	18	417	435	50	485	97	582	18	600

Petroleum Centre, Venango Co., Pa. From the books of the Oil Company.

Rock interval.	STRAY SAND.			Rock interval.	THIRD SAND.			Pocket.......	Feet depth....
	Top......		Bottom...		Top......		Bottom..		
76	543	30	573	20	593	50	643	10	653
58	520	30	550	21	571	53	624	3	627
49	612	30	642	20	662	54	716	6	722
68	553	30	583	20	603	51	654	3	657
76	469	31	500	10	510	52	562	8	570
39	520	32	552	20	572	43	615	3	618
46	510	30	540	19	559	53	612	6	618
53	677	33	710	21	731	49	780	15	795
44	680	30	710	19	729	41	770	11	781
53	723	30	753	17	770	40	810	0	810
63	754	32	786	18	804	46	850	0	850
52	747	34	781	12	793	39	832	5	837
60	397	33	430	17	447	45	492	3	495
54	754	30	784	21	805	40	845	5	850
37	507	25	532	30	562	42	604	0	604
74	509	33	542	14	556	50	606	0	606
69	506	30	536	15	551	37	588	7	595
78	758	28	786	12	798	45	843	0	843
54	729	31	760	15	775	40	815	6	821
67	785	27	812	18	830	36	866	2	868
53	568	31	599	19	618	34	652	3	655
40	550	33	583	17	600	38	638	3	641
45	500	33	533	22	555	40	595	3	598
51	551	29	580	20	600	45	645	3	648
54	568	30	598	21	618	50	668	3	671
46	515	31	546	20	566	39	605	5	610
53	533	26	559	15	574	38	612	3	615
64	545	29	574	12	586	37	623	4	627
49	447	33	480	20	500	40	540	5	545
52	616	27	643	12	655	33	688	2	690
50	558	30	588	22	610	50	660	5	665
52	757	28	785	24	809	41	850	3	853
73	627	30	657	18	675	50	725	2	727
63	618	33	651	17	668	30	698	3	701
71	552	21	573	17	590	50	640	2	642
60	691	26	717	19	736	50	786	5	791
45	572	30	602	35	637	40	677	1	678
53	737	30	767	17	784	50	834	5	839
64	540	29	569	16	585	54	639	3	642
33	784	27	811	13	824	44	868	2	870
65	775	27	802	13	815	39	854	1	855
50	750	30	780	20	800	35	835	2	837
18	580	33	613	19	632	52	684	5	689
53	543	29	572	10	582	43	625	3	628
55	655	32	687	18	705	35	740	3	743

Columbia Farm (Old Story Farm) on Oil Creek, one mile below Columbia

	NAME OF WELL.	Depth of conductor......	Rock interval,	FIRST SAND.			Rock interval,	SECOND SAND.		
				Top......		Bottom..		Top......		Bottom..
834	No. 114.............	27	405	432	72	504	72	576	24	600
835	No. 115.............	27	308	335	37	372	100	472	25	497
836	No. 116.............	27	445	472	38	510	108	618	21	639
837	No. 117.............	9	206	215	40	255	94	349	20	369
838	No. 118.............	18	517	535	32	567	99	666	25	691
839	No. 119.............	18	304	322	18	340	125	465	20	485
840	No. 120.............	18	492	510	30	540	102	642	23	665
841	No. 121.............	30	143	173	29	202	111	313	27	340
842	No. 122.............	36	134	170	40	210	90	300	35	335
843	No. 123.............	14	346	360	45	405	110	515	25	540
844	No. 124.............	16	294	310	30	340	135	475	25	500
845	No. 125.............	30	304	334	38	372	97	469	23	492
846	No. 126.............	15	441	456	20	476	124	600	24	624
847	No. 127.............	18	410	428	20	448	102	550	24	574
848	No. 128.............	18	312	330	56	386	100	486	25	511
849	No. 129.............	27	235	262	35	297	102	399	28	427
850	No. 130.............	20	286	306	41	347	100	447	28	475
851	No. 131.............	18	507	525	40	565	100	665	24	689
852	No. 132.............	16	217	233	30	263	110	373	24	397
853	No. 133.............	26	169	195	45	240	105	345	20	365
854	No. 134.............	13	470	483	39	522	98	620	35	655
855	No. 135.............	28	469	497	30	527	102	629	29	658
856	No. 136.............	13	417	430	71	501	72	573	23	596
857	No. 137.............	11	349	360	40	400	100	500	26	526
858	No. 138.............	14	366	380	45	425	95	520	22	542
859	No. 139.............	36	306	342	39	381	99	480	28	508

Petroleum Centre, Venango Co., Pa. From the books of the Oil Company.

Rock interval.	STRAY SAND.			Rock interval..	THIRD SAND.			Pocket........	Feet depth....
	Top......		Bottom..		Top......		Bottom..		
62	662	30	692	18	710	48	758	2	760
60	557	29	586	19	605	52	657	7	664
91	730	31	761	*	750	41	791	2	793
64	433	33	466	18	484	52	536	5	541
62	753	33	786	17	803	45	848	5	853
53	538	30	568	12	580	55	635	5	640
66	731	27	758	20	778	47	825	5	830
61	401	33	434	22	456	45	501	2	503
58	393	31	424	18	442	43	485	2	487
61	601	29	630	20	650	45	695	5	700
85	585	26	611	14	625	38	663	0	663
72	564	22	586	20	606	47	653	2	655
44	668	29	697	18	715	53	768	3	771
53	627	31	658	20	678	54	732	2	734
47	558	27	585	18	603	37	640	5	645
73	500	26	526	12	538	45	583	5	588
77	552	24	576	14	590	40	630	2	632
63	752	28	780	20	800	41	841	3	844
61	458	32	490	17	507	35	542	30	572
64	429	33	462	17	479	38	517	20	537
45	700	35	735	25	760	50	810	5	815
62	720	32	752	15	767	40	807	8	815
64	660	28	688	17	705	45	750	10	760
80	606	26	632	*	630	55	685	5	690
81	623	30	653	*	650	52	702	5	707
43	551	29	580	34	614	44	658	5	663

***These are evidently errors in Nos. 116, 137 and 138, as the bottom of the Stray SS. as here given overlaps upon the 3d SS.**

Notes.

In drilling an oil well the measures passed through are necessarily divided into three groups or divisions. Each one of these divisions requires a specific treatment at the hands of the driller.

The first division is composed of drift or the loose surface accumulations from the surrounding rocks; the second embraces the immediately underlying series of stratified rocks to the depth at which they contain water; and the third, the remainder of the well, including the oil sands at the bottom. The walls of the third division are generally self-supporting, remaining just as the drill leaves them, and this division, when the well is completed, is the only one where the rocky walls are bare.

The first division, owing to the loose and crumbling material of which it is composed, requires some mechanical device to prevent it from slipping or caving into the hole as it is drilled. Here the "conductor" is used. A "conductor" may be simply a long box, without ends, made by spiking together four planks 2″ thick by 10″ wide—a "wooden conductor;" or it may be "drive pipe," composed of a number of cast-iron cylinders joined together and driven through the deposit; or it may be what is now more generally used, wrought-iron "surface casing," put in in a somewhat similar manner.

The "wooden conductor" can only be economically used where the surface deposit is of inconsiderable depth, as a pit must be sunk to the rock before it can be put in place. After the rock has been laid bare by the pick and shovel, the "conductor" is securely set between it and the derrick floor, the drill is let down to the rock through the conductor and the work of boring commences.

Where it is suspected that the floor of the drift lies too deep to be reached by digging, cast-iron "drive pipe" is used. This pipe is cast in sections about 9′ long. A space of 4″ at each end is carefully turned in a lathe to a certain gauge, and the end is cut smoothly at right angles to the axis of the pipe, so that the joints will stand perpendicularly one upon the other. A joint of pipe is placed on end in the centre of the derrick between two "guides," which have been temporarily erected for the purpose of driving it. A heavy "mall" working between these guides is raised and dropped upon the pipe, slowly forcing it into the ground, precisely as piles are driven for docks, bridges, &c. When the top of a joint has been driven to the level of the derrick floor a band of wrought-iron, made to fit the turned ends of the pipe, and heated red-hot, is quickly slipped upon the end of the driven pipe and another joint at once set up. The contraction of this band in cooling holds the two joints firmly together, and the driving process then goes on. In this way joint after joint is added and driven until solid rock is reached. As many as 23 joints have been used in a well. Great care is required when so long a "string of pipe" is driven to keep it straight and perpendicular, a broken band, or a large boulder encountered may cause the pipe to so far deviate from the perpendicular as to necessitate the abandonment of the well. To avoid this the pipe should be frequently cleaned out by the drill while being driven.

The more common method now employed in driving the well shafts through these thick accumulations of loose materials is to use heavy wrought-iron casing, made expressly for the purpose and armed with a hardened collar or "shoe" at the bottom. This casing is made in joints about 20′ in length, which screw together in wrought-iron "thimbles," the same as do ordinary gas pipes. The tube being thin and light, as compared with cast-iron drive pipe, cannot be so forcibly driven, but is worked down carefully by drilling a hole the full size of its inside diameter, and always keeping this hole open some feet in advance of the bottom of the pipe. In the old filled up valley of the Tunanguant, at Tarport, M'Kean Co., Pa., from 200′ to 300′ of this casing is required in each well.

Wells are spoken of indiscriminately as "small holes" or "wet holes" on the one hand, and as "cased holes" or "dry holes" on the other. A "small hole" must necessarily be a "wet" one, for there is no room to case off the water while drilling; and a "cased hole" must necessarily be a "dry" one, if the casing accomplishes the purpose for which it is used.

If now a well is to be drilled "wet," that is, if no effort is to be made to shut off the water which comes into it from the second division mentioned above, to keep it from following the drill down to the oil rocks, then this "conductor" of which we have been speaking, whether of wood, cast-iron or casing, needs only to be 6″ in diameter, inside measurement. But if the well is to be drilled "dry" an 8″ conductor must be used, as will be seen further on.

In the first case, (for a wet well,) after the conductor is in place, a plain 5½″ hole is drilled all the way to the oil rocks; the water, meantime, nearly filling the well, or perhaps overflowing at the top of the conductor.

In the latter case, (for a dry hole,) an 8″ hole is to be drilled from the bottom of the conductor to a point below the water veins. When this is done, a 5⅝″ casing (inside diameter) is inserted, with a device on the bottom so arranged that it will form a water tight joint between the casing and wall of the well. A 5½″ hole is then continued down to the oil rocks from the inside of this last "string of casing." If the casing has been inserted to the proper depth and no water is encountered below it, the sand-pump will soon exhaust the water in the process of drilling, and the well be perfectly dry. But if lower veins of water are struck, the casing must be drawn, the hole reamed out to a greater depth, and the casing continued down below them. After the water is exhausted, a few pails full are poured in, as circumstances demand, to moisten the drillings and furnish fluid for the sand-pump.

Comparing now the two wells when completed and ready for the pump, we find them both of the same size, 5½″ in diameter. One has simply a conductor through the upper division, all the stratified rocks being bare, is full of water, and has probably shown but very little indication of oil. The other has a conductor through the upper division, casing inside of this to the bottom of the middle division, and is dry—or at least was dry until the striking of the oil sand, when it immediately filled up several hundred feet with oil, or perhaps flowed.

The "dry" well is ready at once for the introduction of the pump tube; the "wet" one must be cased before it is tubed. The casing used for this purpose ("small casing,") is of 3¼″ inside diameter. A "water packer" or "seed bag" is attached to its lower end, which effectually closes the annular space between the outside of the casing and wall of the well. This "small casing," of course, must extend down to the bottom of the second division, the same as the large casing does in the "dry" well, for it has precisely the same duty to perform, the shutting off of the water in the upper rocks from the well shaft.

The well is now tubed with the ordinary 2″ "tubing," having a "working barrel" or pump chamber at the bottom, which is placed at or near the point where the oil enters.

Inside of the "tubing" are inserted the "sucker rods," which are connected in the derrick to the "walking beam," and operate the pump valves below.

Upon starting the pump the "water packer" prevents any of the fluid outside of the casing from entering the well, and the water inside of the casing and in the uncased portion of the well is soon pumped out and the well is said to be "exhausted." As the well exhausts, the oil, which has been held back in the rock by the pressure of the heavy column of water above it, gradually forces its way into the well and is raised by the pump to the surface, unless it has a sufficient force of gas to flow of its own accord afterwards.

Further and detailed information on these and other points will be published in the Report of Progress, I.I.I., 1877.

CHAPTER V.

PITHOLE.

Records of Wells at Pithole City and vicinity, Cornplanter township, Venango County, drilled on the M'Kinney, Morey, Holmden, Rooker, Ball, Hyner, Babbitt, Reynolds and Dawson Farms.

These Pithole wells were drilled in 1865 and 1866, before the introduction of "dry casing" and before the ordinary 3¼ inch casing had come into general use. The larger part of them, therefore, were tested in the primitive way with a common flax-seed bag on the tubing.

Authority, (unless otherwise stated,) Mr. Samuel Minor, of Titusville, to whose large experience in oil operations and wise forethought in preserving every record obtained, in a book kept especially for the purpose, we are indebted for much valuable information in connection with these old wells.

GROUP 1.

M'KINNEY FARM.

(15 *Wells.*)

860. *Well No.* 1, *Lease No.* 10.

Well mouth above ocean in feet..................................				
? (Interval unknown)........................	120	to	120	=
1st SS. (First Sandstone) estimated....	12	"	132	=
?..	225	"	357	=
2d SS., estimated............................	22	"	379	=
?..	65	"	444	=
3d SS., estimated............................	18	"	462	=
?..	137	"	599	=
4th SS....................................	21	"	620	=

Wet hole. Seed bag at 372′ not effectual, but at 490′ effectual. No salt water.

861. *Well No.* 2. *Lease No.* 10.

December, 1865.

Authority, H. M. Haskell.

Well mouth above ocean in feet					1336
? (Interval unknown)	115	to	115	=	1221
1st SS. (First Sandstone)	12	"	127	=	1209
?	235	"	362	=	974
2d SS	22	"	384	=	952
?	56	"	440	=	896
3d SS	17	"	457	=	879
?	38	"	495	=	841
Stray	8	"	503	=	833
?	102	"	605	=	731
4th SS	20	"	635	=	701

Wet hole. Seed-bagged on tubing at 500′. Production, 28 barrels per day.

In July, 1866, the well was cased at 500′, with 3¼″ casing, and the production immediately increased to 70 barrels per day. In March of the following year it was still doing about 60 barrels.

862. *Well No.* 17.

Well mouth above ocean in feet				
Conductor	8 feet.			
Slate	92	to	100	=
1st SS	5	"	105	=
?	260	"	365	=
2d SS	12	"	377	=
?	88	"	465	=
3d SS., 18 inch crevice	12	"	477	=
?	125	"	602	=
4th SS, 8 inch crevice	17	"	619	=
? pocket,	1	"	620	=

Wet hole. Seed bags at 365′ and 465′. This well was located on east bank of Pithole creek.

863. *Well No.* 29 (*Old No.* 6).

Well mouth above ocean in feet				
?	375	to	375	=
2d SS	26	"	401	=
?	55	"	456	=
3d SS., A.	21	"	477	=

Soapstone	8	to	485	=
? estimated	30	"	515	=
3d SS., B.	30	"	545	=
?	55	"	600	=
4th SS	28	"	628	=

Wet hole.

864. *Well No.* 39.

Well mouth above ocean in feet				
Drive pipe	35	to	35	=
? (Interval unknown)	88	"	123	=
1st SS. (First Sandstone)	40	"	163	=
Black sandy rock	89	"	252	=
2d SS., thin and in hard streaks.				
3d SS., about 14 feet thick.				

Wet hole. Seed bag at 369′.

Fourteen inch crevice at 611′, and 5 inch crevice at 614′.

This well was located on the bank of Pithole creek.

865. "*Island Well,*" *or No.* 40.

Well mouth above ocean in feet				
?	599	to	599	=
4th SS	26	"	625	=

Wet hole. Seed bag at 347′. Tubed at 586′.

When pumping, the gravity of the oil was about 45° ; when flowing it was about 47°.

When the sucker rods were drawn it increased the flow from 90 to 240 barrrels, and so the flowing continued for six months, when it fell to 92 barrels.

Before the 4th SS. was struck the water constantly ran over the drive pipe, but upon striking the 4th SS. the water dropped 15′.

Since pumping began the well has produced from 10 to 40 barrels per day.

866. *Well No.* 63.

Well mouth above ocean in feet				
Drive pipe	63	to	63	=
?	90	"	153	=
1st SS	50	"	203	=
?	197	"	400	=
2d SS	40	"	440	=
?	40	"	480	=
3d SS	20	"	500	=

?	36	to	536	=
4th SS	9	"	545	=
?	92	"	637	=
5th SS	20	"	657	=

Wet hole. Seed bag at 496′.

867. *Well No.* 68.

Well mouth above ocean in feet				
? (Interval unknown)	160	to	160	=
1st SS. (First Sandstone) estimated	50	"	210	=
?	146	"	356	=
2d SS	19	"	375	=
?	65	"	440	=
3d SS., A, hard red SS., estimated	12	"	452	=
?	8	"	460	=
3d SS., B, hard white SS., estimated	18	"	478	=
?	27	"	505	=
4th SS	17	"	522	=
?	80	"	602	=
5th SS	12	"	614	=
? pocket,	12	"	626	=

Wet hole.

868. *Well No.* 73.

Well mouth above ocean in feet				
?	128	to	128	=
1st SS	16	"	144	—
?	284	"	428	=
2d SS	18	"	446	=
?	44	"	490	=
3d SS., A	12	"	502	=
?	30	"	532	=
3d SS., B	18	"	550	=
?	78	"	628	=
4th SS. (12′ gray, 6′ pebble, 4′ white)	22	"	650	=
Slate and shells pocket,	5	"	655	=

Wet hole. Well pumped red water, but no oil.

869. *Well, No.* 91.

Well mouth above scean in feet				
Conductor	50	to	50	=
?	129	"	179	=
1st SS., estimated	40	"	219	=
?	188	"	407	=
2d SS	27	"	434	=
?	61	"	495	=
3d SS., A	20	"	515	=
?	40	"	555	=

3d SS., B	15	to	570	=
?	75	"	645	=
4th SS	25	"	670	=
? pocket,	10	"	680	=

Wet hole.

870. *Well No.* 103.

Well mouth above ocean in feet

Drive pipe	48	to	48	=
? (Interval unknown)	131	"	179	=
1st SS. (First Sandstone)	100	"	279	=
?	127	"	406	=
2d SS	44	"	450	=
?	52	"	502	=
3d SS., A	19	"	521	=
?	33	"	554	=
3d SS., B, (gray)	23	"	577	=
?	65	"	642	=
4th SS., A	20	"	662	=
Mud vein	1	"	663	=
4th SS., B	11	"	674	=
? pocket,	6	"	680	=

Wet hole.

871. *Well No.* 104.

About 48 feet above Pithole creek.

Well mouth above ocean in feet

Drive pipe	54	to	54	=
?	104	"	158	=
1st SS	52	"	210	=
?	210	"	420	=
2d SS	10	"	430	=
?	52	"	482	=
3d SS	20	"	502	=
?	33	"	535	=
4th SS.. { Upper part, red.. Lower part, gray.. }	25	"	560	=
?	78	"	638	=
5th SS	18	"	656	=

Wet hole.

In the 5th SS. there was a hard shell of nine inches and a crevice of one foot just below the shell.

Depth of well, 655′; drilled 17′ in the sand.

The well was afterwards drilled deeper and another sand was found at 664′. After drilling 2 feet into this sand the tools stuck.

872. *Well No.* 105.

Well mouth above ocean in feet				
Drive pipe	54	to	54	=
? (Interval unknown)	352	“	406	=
2d SS. (Second Sandstone)	40	“	446	=
?	44	“	490	=
3d SS., A	20	“	510	=
?	32	“	542	=
3d SS., B	19	“	561	=
?	83	“	644	=
4th SS	18	“	662	=
? pocket,	5	“	667	=

Wet hole. Mud vein at 657′.

873. *Well No.* 107

Well mouth above ocean in feet				
Conductor	19	to	19	=
?	163	“	182	=
1st SS	35	“	217	=
?	213	“	430	=
2d SS	15	“	445	=
?	58	“	503	=
3d SS., A	20	“	523	=
?	35	“	558	=
3d SS., B	25	“	583	=
?	72	“	655	=
4th SS	19	“	674	=
? pocket,	6	“	680	=

Wet hole. Seed bag at 437′.

874. *Well No.* 119.

Well mouth above ocean in feet				
Drive pipe	20	to	20	=
Sandstone	20	“	40	=
?	195	“	235	=
1st SS., estimated	35	“	270	=
?	140	“	410	=
2d SS., A	12	“	422	=
Slate	2	“	424	=
2d SS., B	33	“	457	=
?	43	“	500	=
3d SS. (crevice and oil show at 506′)	20	“	520	=
?	30	“	550	=
4th SS	23	“	573	=
?	80	“	653	=
5th SS. (fine and hard; mud at 661′)	19	“	672	=
Slate	4	“	676	=
6th SS	12	“	688	=
? pocket,	3	“	691	=

Wet hole. The drive pipe struck the thinned edge of one of the mountain sands cropping out on the hillside.

GROUP 2.

MOREY FARM.

(10 *wells.*)

875. *Well No.* 1, *Lease No.* 1

Well mouth above ocean in feet				
? (Interval unknown)	**113**	**to**	**113**	**=**
1st SS. (First Sandstone)	**19**	**"**	**132**	**=**
?	**224**	**"**	**356**	**=**
2d SS	**16**	**"**	**372**	**=**
?	**73**	**"**	**445**	**=**
3d SS., estimated	**30**	**"**	**475**	**=**
?	**115**	**"**	**590**	**=**
4th SS. (crevice at 600′)	**15**	**"**	**605**	**=**

Wet hole.

876. *Well No.* 1, *Lease No.* 2.

Well mouth above ocean in feet				
?	**120**	**to**	**120**	**=**
1st SS	**66**	**"**	**186**	**=**
?	**173**	**"**	**359**	**=**
2d SS	**24**	**"**	**383**	**=**
?	**57**	**"**	**440**	**=**
3d SS., estimated	**30**	**"**	**470**	**=**
?	**117**	**"**	**587**	**=**
4th SS., estimated	**16**	**"**	**603**	**=**

Wet hole.

877. *Well No.* 1, *Lease No.* 3.

Well mouth above ocean in feet				
?	**122**	**to**	**122**	**=**
1st SS	**60**	**"**	**182**	**=**
?	**191**	**"**	**373**	**=**
2d SS	**10**	**"**	**383**	**=**
?	**64**	**"**	**447**	**=**
3d SS., estimated	**30**	**"**	**477**	**=**
?	**113**	**"**	**590**	**=**
4th SS	**15**	**"**	**605**	**=**

Wet hole. Seed bag at 445′. Tubed at 592′. Mud vein at 610′.

878. *Well No.* 2, *Lease No.* 3.

Well mouth above ocean in feet				
? (Interval unknown)	122	to	122	=
1st SS. (First Sandstone)	60	"	182	=
?	191	"	373	=
2d SS	10	"	383	=
?	64	"	447	=
3d SS., estimated	30	"	477	=
?	113	"	590	=
4th SS	15	"	605	=

Wet hole.

At 600′ a 2′ crevice was found. SS. mixed with pebbles and very shelly.

879. *Well No.* 3, *Lease No.* 5.

Well mouth above ocean in feet				
?	124	to	124	=
1st SS	23	"	147	=
?	218	"	365	=
2d SS	26	"	391	=
?	52	"	443	=
3d SS	28	"	471	=
?	116	"	587	=
4th SS	20	"	607	=

Wet hole.

880. *Well No.* 4, *Lease No.* 5.

Well mouth above ocean in feet				
?	115	to	115	=
1st SS	20	"	135	=
?	225	"	360	=
2d SS	30	"	390	=
?	47	"	437	=
3d SS	33	"	470	=
?	115	"	585	=
4th SS	19	"	604	=

Wet hole. Seed bag at 365′. Tubed at 534′.

At 458′ there was a mud vein and crevice, with big show of oil.

The well flowed during the night of the day upon which the pump was started.

881. *Well No.* 155.

Sixty-five feet above bottom of Pithole creek, situated about 55 rods west of creek.

Well mouth above ocean in feet					
? (Interval unknown)	15	to	15	=	
SS. (Sandstone)	40	“	55	=	
?	170	“	225	=	
1st SS	18	“	243	=	
?	214	“	457	=	
2d SS	25	“	482	=	
?	51	“	533	=	
3d SS., fine and white	18	“	551	=	

Wet hole.

882. *Well No.* 184, *or* “*Burtis Well.*”

February 3, 1866.

+ Fifty feet above Pithole creek. Situated about 50 rods west of creek.

Well mouth above ocean in feet					
?	400	to	400	=	
2d SS	30	“	430	=	
?	57	“	487	=	
3d SS	22	“	509	=	
?	139	“	648	=	
4th SS	12	“	660	=	

Wet hole.

This well was only drilled into the 4th SS., and not through it. Depth of well, 660′ 8″.

Production at first, (flowing) 600 barrels per day.

883. *Well No.* 4, *Copeland Reserve.*

Well mouth above ocean in feet					1334
?	120	to	120	=	1214
1st SS	10	“	130	=	1204
?	240	“	370	=	964
2d SS	15	“	385	=	949
?	65	“	450	=	884
3d SS	20	“	470	=	864
?	30	“	500	=	834
4th SS	18	“	518	=	816
?	91	“	609	=	725
5th SS	21	“	630	=	704
? pocket,	10	“	640	=	694

Wet hole.

884. *Well No. 8, Copeland Reserve.*

Well mouth above ocean in feet					
? (Interval unknown)	160	to	160	=	
1st SS. (First Sandstone)	20	"	180	=	
?	180	"	360	=	
2d SS., estimated	15	"	375	=	
?	69	"	444	=	
3d SS	33	"	477	=	
?	115	"	592	=	
4th SS	18	"	610	=	
? pocket,	2	"	612	=	

Wet hole.

At 580′ a shell of SS. was found about 4′ thick, and then a mud vein.

This well produced no oil.

Five wells were found on this Copeland Reserve which had not penetrated the 4th SS.

GROUP 3.

HOLMDEN FARM.

(5 *wells.*)

885. *Frazer (United States) Well.*

February, 1865.

Well mouth above ocean in feet					1324
?	95	to	95	=	1229
1st SS	40	"	135	=	1189
?	215	"	350	=	974
2d SS	30	"	380	=	944
?	85	"	465	=	859
3d SS	20	"	485	=	839
?	110	"	595	=	729
4th SS	12	"	607	=	717
? pocket,	1	"	608	=	716

Wet hole. Seed bag on tubing at 364½′. Tubed at about 590′. Fresh water at 115′.

This well began flowing a regular stream in January, 1865, at the rate of 200 barrels per day; the sucker rods being at that time in the tubing. In June, 1865, the sucker rods were removed, when the flow increased to 800 barrels per day. The oil flows in jets, according to trials on four different days, at the rate of 40 jets per minute. The oil at the well has a gravity of 53°, and at the shipping tanks 46°.

886. *Well No.* 115.

Well mouth above ocean in feet				
? (Interval unknown)....(including 1st SS.)	470	to	470	=
2d SS. (Second Sandstone).......estimated....	10	"	480	=
?	110	"	590	=
3d SS., estimated	20	"	610	=
?	9	"	619	=
4th SS	26	"	645	=

Wet hole. Produced no oil.

887. *Well No.* 127.

Elevation, 45′ above Pithole creek. Situated about 12 rods from Well No. 115, and 14′ above it.

Well mouth above ocean in feet				
?	157	to	157	=
1st SS	100	"	257	=
?	128	"	385	=
2d SS	10	"	395	=
?	85	"	480	=
3d SS	20	"	500	=
?	131	"	631	=
4th SS., estimated	15	"	646	=

Wet hole. Produced oil in paying quantities.

888. *Well No.* 129.

About 55′ above Pithole creek.

Well mouth above ocean in feet				
? (including 1st and 2d SS	528	to	528	=
3d SS	11	"	539	=
?	89	"	628	=
4th SS	11	"	639	=

Wet hole.

889. *Pithole Water Well.*

Holmden farm, Pithole. On the high hill back of Pithole City.

Well mouth above ocean in feet				
Conductor	15	to	15	=
Slate	30	"	45	=
Slate and SS., mixed	60	"	105	=
Slate	26	"	131	=

SS., white	38	to	169	=
Slate	25	"	194	=
SS., yellow	13	"	207	=

Supply of water obtained about 50′ below the level of the valley of Pithole creek.

GROUP 4.

ROOKER FARM.

(3 *wells.*)

890. *Well near U. S. Well.*

Well mouth above ocean in feet				
? (Interval unknown	100	to	100	=
1st SS. (First Sandstone),	35	"	135	=
?	227	"	362	=
2d SS	10	"	372	=
?	88	"	460	=
3d SS	10	"	470	=
?	20	"	490	=
4th SS. (mud veins)	25	"	515	=
?	90	"	605	=
5th SS	15	"	620	=

Wet hole.

891. *Well No. 2.*

Well mouth above ocean in feet				
?	100	to	100	=
1st SS	35	"	135	=
?	227	"	362	=
2d SS	15	"	377	=
?	83	"	460	=
3d SS	10	"	470	=
?	24	"	494	=
4th SS	25	"	519	=
?	86	"	605	=
5th SS	17	"	622	=
? pocket,	18	"	640	=

Wet hole. Crevice of 2′ in 3d SS. Mud vein at 513′.

892. *Well No.* 6.

Well mouth above ocean in feet				
? (Interval unknown)	100	to	100	=
1st SS. (First Sandstone)	43	"	143	=
?	187	"	330	=
2d SS., gray, 18' of shells	50	"	380	=
?	90	"	470	=
3d SS., white, pebbles	20	"	490	=
?	30	"	520	=
4th SS., pebble on top	30	"	550	=
?	55	"	605	=
5th SS	4	"	609	=
? pocket,	38	"	647	=

Wet hole. Crevice of 18 inches at 485′; one of 8 inches at 489′, and one of 10 inches at 493′.

GROUP 5.

BALL FARM.

(4 *wells.*)

893. *Well No.* 1.

Well mouth above ocean in feet				
?	120	to	120	=
1st SS	14	"	134	=
?	236	"	370	=
2d SS	20	"	390	=
?	45	"	435	=
3d SS	22	"	457	=
?	35	"	492	=
4th SS	22	"	514	=
?	83	"	597	=
5th SS	13	"	610	=
? pocket,	5	"	615	=

Wet hole. Mud vein at 505′.

894. *Well No.* 4.

Well mouth above ocean in feet				
?	103	to	103	=
1st SS., estimated	20	"	123	=
?	242	"	365	=
2d SS., estimated	20	"	385	=

?	112	to	497	=	
3d SS., estimated	15	"	512	=	
?	78	"	590	=	
4th SS., estimated	20	"	610	=	
? pocket,	6	"	616	=	

895. *Well No.* 5.

Well mouth above ocean in feet					
? (Interval unknown)	120	"	120	=	
1st SS. (First Sandstone)	32	"	152	=	
?	211	"	363	=	
2d SS., white	30	"	393	=	
?	51	"	444	=	
3d SS., coarse gray	22	"	466	=	
?	40	"	506	=	
4th SS., hard gray	14	"	520	=	
?	63	"	583	=	
5th SS., light gray, pebbles at top	27	"	610	=	
? pocket,	7	"	617	=	

896. *Murphy Well.*

Well mouth above ocean in feet					
?	250	to	250	=	
1st SS	20	"	270	=	
?	214	"	484	=	
2d SS	15	"	499	=	
?	66	"	565	=	
3d SS., A	20	"	585	=	
?	30	"	615	=	
3d SS., B	25	"	640	=	
?	80	"	720	=	
4th SS	20?	"	740?	=	

GROUP 6.

HYNER, BABBITT, REYNOLDS FARMS.

897. *Amazon Well, No.* 7.

1865.

Hyner farm, Pithole. Authority, Kuhnu Kuhn, Supt.

Well mouth above ocean in feet					1470
?	540	to	540	=	930
2d SS	40	"	580	=	890

?	20	to	600	=	870
3d SS. (upper 30′ shelly)	50	"	650	=	820
Slate	5	"	655	=	815
Red rock, estimated	25	"	680	=	790
Slate	62	"	742	=	728
4th SS	25	"	767	=	703
Slate... pocket,	11	"	778	=	692

Wet hole. Mud vein at 757′.

898. *Amazon Well No.* 14

1865.

Hyner farm, Pithole. Authority, Kuhnu Kuhn, Supt.

Well mouth above ocean in feet					1504
? (Interval unknown)	530	to	530	=	974
2d SS. (Second Sandstone)	30	"	560	=	944
?	60	"	620	=	884
3d SS	70	"	690	=	814
?	92	"	782	=	722
4th SS	20	"	802	=	702

Wet hole. Mud vein at 793′.

899. *Well No.* 1.

Babbitt farm, Pithole, situated close to Holmden run, and about five-eighths of a mile from United States well.

Well mouth above ocean in feet					
Drive pipe	27	to	27	=	
Rock	60	"	87	=	
Slate and SS., dark (2′ crevice and heavy gas vein)	40	"	127	=	
Slate, dark, (heavy water course 257′)	130	"	257	=	
Slates of different kinds (gas)	23	"	280	=	
2d SS., white	25	"	305	=	
Slate, hard	40	"	345	=	
Slate, soft and red	10	"	355	=	
SS., coarse dark pebble, intermixed with slate,	45	"	400	=	
Soapstone	30	"	430	=	
Slates of different kinds	121	"	551	=	
3d SS	20	"	571	=	
Slate	40	"	611	=	
Slate, soft and red (mud vein 1′)	11	"	622	=	
Slate, with occasional layers of SS. 6″ to 1′	78	"	700	=	
Slate	28	"	728	=	
4th SS	6	"	734	=	
Slate	9	"	743	=	

This well was unproductive, and evidently has not reached the 4th SS. of Pithole flats. S.Minor.

900. *Well No.* 41.

Reynolds farm, Pithole. Situated one-fourth mile below United States well, 40 rods from Pithole creek and 67 feet above the surface of the creek. Record commences at bottom of 4th sand at 731′.

Well mouth above ocean in feet					
? (Interval unknown)	731	to	731	=	
?	87	"	818	=	
5th SS. (Fifth Sandstone)	18	"	836	=	
?	46	"	882	=	
6th SS	20	"	902	=	
?	38	"	940	=	
7th SS	30	"	970	=	
?	32	"	1002	=	

Crevice and oil show at 980′, and strong gas vein at 990′.

GROUP 7.

DAWSON FARM.

(3 *wells.*)

901. *Hoosier Well.*

Dawson farm, Pithole creek, 1 mile above Pithole City.

Well mouth above ocean in feet					1363
?	124	to	124	=	1239
1st SS	24	"	148	=	1215
?	209	"	357	=	1006
2d SS	40	"	397	=	966
?	60	"	457	=	906
3d SS	30	"	487	=	876
?	108	"	595	=	768
4th SS	20	"	615	=	748
?	24	"	639	=	724
5th SS	20	"	659	=	704
? pocket,	4	"	663	=	700

The well was tested at 615′ and 633′, but produced no oil. It was drilled to 643′ and again tested, producing considerable oil, but when completed the former production was doubled.

Two other wells near this give a thickness of 14′ and 22′, respectively, to the 4th SS

902. *Well No.* 25.

Dawson farm, Pithole; on Dawson run, half a mile east of Pithole creek at Dawson Centre, and about 150′ above level of the creek.

Well mouth above ocean in feet......................................				
Drive pipe..	36	to	36	=
? (Interval unknown)	131	"	167	=
1st SS. (First Sandstone) ....estimated....	20	"	187	=
?..	291	"	478	=
2d SS..	25	"	503	=
?..	75	"	578	=
3d SS..	18	"	596	=
?..	89	"	685	=
4th SS..	2	"	687	=
?..	53	"	740	=
5th SS..	18	"	758	=
?.. pocket,	7	"	765	=

Wet hole. Seed bag first at 498′ and afterwards at 580′.

903. *Ripley Well.*

Dawson Farm, Pithole; Burtis, Hart & Burrows tract.

Well mouth above ocean in feet......................................				
?..	125	to	125	=
1st SS..	25	"	150	=
?..	198	"	348	=
2d SS..	47	"	395	=
?..	45	"	440	=
3d SS., show of oil............................	35	"	475	=
?..	25	"	500	=
4th SS., show of oil...........................	18	"	518	=
?..	77	"	595	=
5th SS..	23	"	618	=
?..	14	"	632	=

Wet hole. Mud vein at 612′. Seed bag at 360′. Bottom of tubing at 804′.

GROUP 8.

MINOR FARM

Six wells on the S. Minor farm, (formerly the north half of of J. N. Tyrrell's farm,) half a mile south of the Farmer's hotel, on the Titusville and Pithole Plank Road, and three miles southeast of Pleasantville.

904. *Well No. 4.*

Well mouth above ocean in feet				
Drive pipe	12	to	12	=
SS., gray	12	"	24	=
Clay, yellow	5	"	29	=
Slate, soft and hard alternating	25	"	54	=
? (Interval unknown)	157	"	211	=
1st SS. (First Sandstone)	40	"	251	=
?	186	"	437	=
2d SS	30	"	467	=
?	68	"	535	=
3d SS	19	"	554	=
?	36	"	590	=
4th SS	19	"	609	=
?	76	"	685	=
5th SS., nearly all pebbles	13	"	698	=
?	3	"	701	=

Water at 40′. Mud, 1 foot, at 543′; 1 foot again at 600′ and 2 inches at 690′. Crevice at 692′.

905. *North Well, Lot No.* 14.

Well mouth above ocean in feet				
Casing	57	to	57	=
?	371	"	428	=
2d SS.	20	"	448	=
?	72	"	520	=
3d SS., A	25	"	545	=
?	35	"	580	=
3d SS., B	20	"	600	=
?	81	"	681	=
4th SS	10	"	691	=
?	29	"	720	=
5th SS	8	"	728	=
? pocket,	8	"	736	=

906. *South Well, Lot No.* 19.

On the bank of Dunham run, a branch of East Pithole creek.

Well mouth above ocean in feet				
Casing	59	to	59	=
? (including 1st SS.)	371	"	430	=
2d SS	25	"	455	=
?	70	"	525	=
3d SS., A	25	"	550	=
?	30	"	580	=
3d SS., B	20	"	600	=

?	74	to	674	=
4th SS	13	“	687	=
?	25	“	712	=
5th SS	10	“	722	=
? pocket,	10	“	732	=

Size of hole, 6 inches to the depth of 436′; 5¾ inches to near the bottom, and 5½ inches at the bottom.

907. *Well No.* 31.

Well mouth above ocean in feet				
Soil	15	to	15	=
SS., loose	8	“	23	=
Clay	5	“	28	=
Slate	188	“	216	=
1st SS. (First Sandstone)	10	“	226	=
? (Interval unknown)	207	“	433	=
2d SS	15	“	448	=
?	76	“	524	=
3d SS., A	28	“	552	=
?	32	“	584	=
3d SS., B	12	“	596	=
?	79	“	675	=
4th SS	15	“	690	=
? pocket,	10	“	700	=

Seed bag at 440′. Well mouth about 20′ above the creek.

908. *Well No.* 34.

Well mouth above ocean in feet				
Conductor	23	to	23	=
?	187	“	210	=
1st SS	25	“	235	=
?	197	“	432	=
2d SS	30	“	462	=
?	65	“	527	=
3d SS., A	25	“	552	=
?	30	“	582	=
3d SS., B	18	“	600	=
? (soft and hard gray shells)	77	“	677	=
4th SS	10	“	687	=
? pocket,	10	“	697	=

Mud vein at 594′. Soft and hard gray shells for 20′ above 4th SS.

909. *Well No.* 47.

Well mouth above ocean in feet				
?	210	to	210	=
1st SS., estimated	25	“	235	=
?	197	“	432	=

2d SS., estimated	30	to	462	=
?	62	"	524	=
3d SS., A, estimated	25	"	549	=
?	33	"	582	=
3d SS., B., estimated	18	"	600	=
?	87	"	687	=
4th SS	10	"	697	=

Seed bag at 434′. Mud vein at 683′.

910. *Well No.* 34.

Second National Petroleum Co. South half of J. N. Tyrrel farm and adjoining S. Minor farm.

Well mouth above ocean in feet				
? (Interval unknown)	175	to	175	=
1st SS. (First Sandstone)	25	"	200	=
?	220	"	420	=
2d SS	31	"	451	=
?	59	"	510	=
3d SS	10	"	520	=
?	33	"	553	=
4th SS	17	"	570	=
?	70	"	640	=
5th SS	18	"	658	=
?	26	"	684	=
6th SS	11	"	695	=
? pocket,	9	"	704	=

[This record seems to be from memory, as all the measurements to top of sands are qualified by the word "about," but the *thickness* of each sand is given without qualification.]

GROUP 9.

KEEP (BEAN); J. N. TYRREL, FARMS; &C.

911. *Downs Well,*

Keep or Bean Farm, 3 miles south-east of Pleasantville, and ½ mile south of Farmer's hotel, on bank of Dunham run, about 50 rods west of J. N. Tyrrel farm.

Well mouth above ocean in feet				
?	206	to	206	=
1st SS	20	"	226	=

?	204	to	430	=
2d SS	10	"	440	=
?	140	"	580	=
3d SS	10	"	590	=
?	90	"	680	=
4th SS. (crevice of 3 feet)	20	"	700	=
? pocket,	20	"	720	=

912. *M'Nair Well.*

J. N. Tyrrel farm, 3 miles south-east of Pleasantville.

Well mouth above ocean in feet				
? (Interval unknown)	225	to	225	=
1st SS. (First Sandstone)	12	"	237	=
?	223	"	460	=
2d SS	18	"	478	=
?	50	"	528	=
3d SS	25	"	553	=
?	132	"	685	=
4th SS	16	"	701	=
?	29	"	730	=
5th SS	18	"	748	=
?	87	"	835	=
Shell	5	"	840	=
? pocket,	10	"	850	=

913. *Pine Shade Well.*

Young farm, 3 miles south-east of Pleasantville, situated about 20 rods below J. N. Tyrrel farm, on Tyrrel run, Allegheny township.

Well mouth above ocean in feet				
?	164	to	164	=
1st SS	56	"	220	=
?	260	"	480	=
Flint, estimated	2	"	482	=
?	8	"	490	=
Red shale, estimated	10	"	500	=
?	30	"	530	=
3d SS	23	"	553	=
? pocket,	2	"	555	=

Large water vein at 170′. Good show of oil at 409′. Mud vein and show of oil at 550′.

In pumping the gas would cause water to flow out. The seed bag burst before the water was exhausted and the well was abandoned.

914. *Genesee and Venango Oil Co. Well.*

At Howarth's mill, 4 miles south-east of Pleasantville.

Well mouth above ocean in feet					
? (Interval unknown)	120	to	120	=	
1st SS. (First Sandstone)	17	"	137	=	
?	218	"	355	=	
2d SS	25	"	380	=	
?	74	"	454	=	
3d SS	25	"	479	=	
?	119	"	598	=	
4th SS	8	"	606	=	
? pocket,	14	"	620	=	

Water was struck at 117′ and flowed at the rate of 2,000 gallons per day.

A crevice of 15 inches in 4th SS. Gas and some oil.

GROUP 10.

MISCELLANEOUS.

(Authority, S. Minor.)

915. *Brown Well,*

West Pithole creek, 2 miles above Paxton house.

Well mouth above ocean in feet					
Drive pipe	60	to	60	=	
?	240	"	300	=	
1st SS	15	"	315	=	
?	135	"	450	=	
2d SS	18	"	468	=	
?	187	"	655	=	
3d SS	22	"	677	=	
? (including 4th and 5th SS.)	173	"	850	=	

Slate, mud veins and soapstone between 4th and 5th SS.

916. *Well at the Bridge.*

Cherry run, north side of Franklin and Warren pike, near Prather homestead, Plumer.

Well mouth above ocean in feet					1293
?	170	to	170	=	1123
1st SS	24	"	194	=	1099

?	204	to	398	=	895
2d SS	70	"	468	=	825
?	34	"	502	=	791
3d SS	30	"	532	=	361

917. *Second National Petroleum Co. Well.*

Duncan and Prather farm, Cherry run near Plumer.

Well mouth above ocean in feet					
Drive pipe	45	to	45	=	
SS	12	"	57	=	
Soapstone	170	"	227	=	
SS	105	"	332	=	
Soapstone	18	"	350	=	
1st SS. (First Sandstone)	25	"	375	=	
? (Interval unknown)	85	"	460	=	
2d SS	30	"	490	=	
?	120	"	610	=	
3d SS	20	"	630	=	
?	110	"	740	=	
4th SS	5	"	745	=	
?	120	"	865	=	
5th SS	35	"	900	=	
?	30	"	930	=	

Little show of oil in each SS. except the 3d SS.

Mud vein just above 3d SS.

Well tubed to 5th SS. and seed bagged at 620′.

At 145′ water was struck.

At 195′ show of oil.

918. *Duncan Well.*

1875.

G. S. Duncan farm between Plumer and Pithole. Authority, one of the drillers.

Well mouth above ocean in feet					
?	340	to	340	=	
1st SS	20	"	360	=	
?	200	"	560	=	
2d SS	65	"	625	=	
?	35	"	660	=	
Stray SS	23	"	683	=	
?	34	"	717	=	
3d SS	25	"	742	=	
?	58	"	800	=	
Stray SS	15	"	815	=	
?	45	"	860	=	
Green oil SS	5	"	865	=	

919. *Phillips Well.*

Duft tract, Rynd farm, on Cherry Run, 1¼ miles above Rouseville. Well situated close to north side of road, and about 15 rods up the run from the Reed well.

Well mouth above ocean in feet				
? (Interval unknown)	250	to	250	=
1st SS. (First Sandstone)	25	"	275	=
?	115	"	390	=
2d SS	25	"	415	=
?	120	"	535	=
3d SS. (small crevice near the top)	30	"	565	=

About 35′ above the 3d SS. is a gray sand, say 10′ thick.

The well was pumped for three days with little show of oil. The sucker rods were then pulled, and the water rose and flowed over the tubing. The water continued to rise and fall several times, bringing up at one time oil, then mud and more oil, until finally, in about six hours, mud, water and oil were forced to the top of the derrick and covered the side and windows of a house near by.

The well has continued to flow oil since at the rate of from 200 to 300 barrels per day. The flow is very steady, with hardly any pulsations.

The "Fry" well, about 50 feet south of the "Phillips," had been flowing 40 or 50 barrels for four or five months, but suddenly stopped when the latter began flowing. The "Fry" was then pumped, when it produced as much as before, and flowed with considerable force at intervals of twenty minutes.

920. *Rondout Well.*

On bank of Cherry Tree run, about 1 mile from its entrance into Oil creek.

Well mouth above ocean in feet				
?	390	to	390	=
1st SS	40	"	430	=
?	35	"	465	=
2d SS	35	"	500	=
?	128	"	628	=
3d SS	25	"	653	=
Slate and soapstone	248	"	901	=

Little oil, but plenty of gas.

921. *Well No. 2.*

Tarr, Story and Cherry Run Oil Co., north side of Pithole road.

Well mouth above ocean in feet				
? (including 1st SS., 30′ thick)	343	to	343	=
2d SS. (water)	22	"	365	⊏
? (Interval unknown)	233	"	598	=
3d SS	36	"	634	=
? pocket,	26	"	660	=

Below the 3d SS. the reamer could not be used, on account of the abundance of soft rock.

922. *Watson Well.*

1873.

Irwin farm, on Cherry Tree run, 2 miles north-west of Petroleum Centre. Authority, Jonathan Watson.

Well mouth above ocean in feet				
?	120	to	120	=
Mountain SS	60	"	180	=
?	190	"	370	=
1st SS	55	"	425	=
?	225	"	650	=
Stray SS	8	"	658	=
?	12	"	670	=
3d SS	15	"	685	=
?	85	"	770	≡
Red rock	35	"	805	=
?	145	"	950	=
Red rock	10	"	960	—
?	50	"	1010	=

No oil found below the 1st SS.

GROUP 11.

WEST HICKORY.

The wells of this group are on West Hickory creek, Stewart's run, Allender run, &c., and the authority for the records is Mr. S. Minor.

Six Manross farm wells, on West Hickory creek, about 2 miles from the Allegheny river.

923. *Well No.* 3 , *near Saw Mill.*

Well mouth above ocean in feet				
? (Interval unknown)	60	to	60	=
1st SS. (First Sandstone)	6	"	66	=
?	16	"	82	=
2d SS	8	"	90	=
? (good show of oil at 120′)	30	"	120	=
3d SS	17	"	137	=
?	25	"	162	=
4th SS	8	"	170	=
? (good show of oil at 225)	55	"	225	=
5th SS	12	"	237	=
?	88	"	325	=
Very soft rock	78	"	403	=

924. *Well No.* 4.

Well mouth above ocean in feet				
?	67	to	67	=
1st SS	40	"	107	=
?	18	"	125	=
2d SS	13	"	138	=
?	31	"	169	=
3d SS	15	"	184	=
?	40	"	224	=
4th SS	12	"	236	=
?	4	"	240	=

925 *Well No.* 7

East end of flat.

Well mouth above ocean in feet				
Drive pipe	22	to	22	=
Surface SS	10	"	32	=
?	29	"	61	=
1st SS	8	"	69	=
?	9	"	78	=
2d SS	5	"	83	=
?	25	"	108	=
3d SS	11	"	119	=
?	24	"	143	=
4th SS (crevice of 1′ at 152)	9	"	152	=
?	8	"	160	=
5th SS. (not through)	6	"	166	=

926. *Well No.* 10.

Well mouth above ocean in feet				
Drive pipe	10	to	10	=
Slate, red	14	"	24	=
?	36	"	60	=
1st SS	9	"	69	=

?	12	to	81	=
2d SS	36	"	117	=
?	28	"	145	=
3d SS	10	"	155	=
?	35	"	190	=
4th SS. (oil at 195′)	16	"	206	=

927. *Well No.* 17.

Well mouth above ocean in feet				
? (Interval unknown)	75	to	75	=
1st SS. (First Sandstone)	35	"	110	=
?	37	"	147	=
2d SS	13	"	160	=
?	30	"	190	=
3d SS., not through	7	"	197	=

928. *Well No.* 38.

North of creek, on the flat.

Well mouth above ocean in feet				
?	35	to	35	=
1st SS	62	"	97	=
?	22	"	119	=
2d SS. (18″ crevice at 123′)	4	"	123	=
?	5	"	128	=

929. *Hinkley Well, No.* 3.

M'Groary farm. Situated 2½ miles west of Allegheny river, and about 5½ miles east south-east from Pleasantville.

Well mouth above ocean in feet				
Conductor	8	to	8	=
?	87	"	95	=
1st SS	13	"	108	=
?	225	"	333	=
2d SS	20	"	353	=
?	12	"	365	=
3d SS., estimated	10	"	375	=

Amber colored oil; burns in lamp without refining. Comes into the well at 370′.

930. *Well No* 2.

Situated on Allender run, on west side of Hickorytown road, and two miles west from Allegheny river, and about six miles east south-east from Pleasantville.

Well mouth above ocean in feet				
?	95	to	95	=
1st SS	15	"	110	=

?	225	to	335	=
2d SS	18	"	353	=
?	47	"	400	=
Flint, white	5	"	405	=

At 405′ the tools stuck, and the well was abandoned.

931. *Fair Farm Well.*

On Stewart's run, six miles south-east of Pleasantville.

Well mouth above ocean in feet				
? (Interval unknown)	94	to	94	=
1st SS. (First Sandstone)	40	"	134	=
?	210	"	344	=
2d SS	30	"	374	=
?	81	"	455	=
3d SS	20	"	475	=
?	127	"	602	=
4th SS	5	"	607	=

Six White Farm Wells on land of J. White, West Hickory creek, 2½ miles from the Allegheny river and half a mile above the Manross farm.

932. *No* 8, " *Shaw Well.*

Well mouth above ocean in feet				
?	102	to	102	=
1st SS., estimated	20	"	122	=
?	25	"	147	=
2d SS., estimated	20	"	167	=
?	173	"	340	=
3d SS., estimated	20	"	360	=
?	192	"	552	=
4th SS	80	"	632	=

Crevices at 387′ and 460′. Oil shows at 387′, 395′, 458′, and strong flow of gas at 577′.

933. *Gillam Well.*

Well mouth above ocean in feet				
?	84	to	84	=
SS	8	"	92	=
?	38	"	130	=
SS	11	"	141	=
?	75	"	216	=
SS	17	"	233	=
?	102	"	335	=
SS	20	"	355	=

934. *No.* 11, *Union Well.*

Well mouth above ocean in feet				
? (Interval unknown)	52	to	52	=
1st SS. (First Sandstone)	98	"	150	=
Slate	178	"	328	=
2d SS	21	"	349	=
?	51	"	400	=

Oil was found at 55′, 85′ and 187′. Production, 10 barrels per day. First quality lubricating oil. Gravity, 29°.

935. *No.* 6, "*Buckhorn Run Well.*"

Well mouth above ocean in feet				
?	115	to	115	=
1st SS	90	"	205	=
?	161	"	366	=
2d SS	22	"	388	=

This well produced nothing.

936. *No.* 19 *Well.*

On the flat.

Well mouth above ocean in feet				
?	98	to	98	=
1st SS	29	"	127	=
?	28	"	155	=
2d SS	38	"	193	=
?	17	"	210	=
3d SS	59	"	269	=
?	9	"	278	=

Production, 5 to 10 barrels per day of lubricating oil, with much water.

937. *No.* 37 *Well.*

?	75	to	75	=
1st SS	27	"	102	=
?	28	"	130	=
2d SS	13	"	143	=
?	39	"	182	=
3d SS	18	"	200	=
?	32	"	232	=
4th SS	12	"	244	=
?	76	"	320	=
5th SS	15	"	335	=
?	68	"	403	=

Five wells on farm of "West Hickory Oil and Mining Co.," at the junction of West Hickory creek with the Allegheny river.

938. *Well No.* 2.

On bank of West Hickory creek, ¼ mile from Allegheny.

Well mouth above ocean in feet				
Conductor	9	to	9	=
Pebble	6	"	15	=
Flags	20	"	35	=
Slate	13	"	48	=
Flags	17	"	65	=
Slate	19	"	84	=
SS., gray and flinty	2	"	86	=
Soap rock	4	"	90	=
Flag SS	5	"	95	=
Red rock	6	"	101	=
Gray SS	11	"	112	=

Seed bag at 10′ from bottom.

Crevice of 18 inches and oil in last sand.

Well flowed for some time and produced quite a large amount of lubricating oil.

939. *Well No.* 3.

About 40 rods north-east of No. 2.

Well mouth above ocean in feet				
Conductor	13	to	13	=
Flag	31	"	44	=
?	31	"	75	=
1st SS	8	"	83	=
?	9	"	92	=
2d SS., white	2	"	94	=
?	34	"	128	=
3d SS	26	"	154	=
?	255	"	409	=
4th SS., gray	16	"	425	=
5th SS., of all kinds	42	"	467	=
?	22	"	489	=
6th SS., of all kinds	11	"	500	=
?	46	"	546	=
7th SS	15½	"	561½	=

940. *Well No.* 4.

Fifty rods up creek from No. 2.

Well mouth above ocean in feet..............................

?	15	to	15	=
SS	47	"	62	=
?	6	"	68	=
SS	33	"	101	=

941. *Well No.* 5.

Situated about 40 rods above No. 4 and 85 rods above No. 3, under the bluffs.

Well mouth above ocean in feet				
?	82	to	82	=
SS	13	"	95	=
?	15	"	110	=
SS	3	"	113	=
?	10	"	123	=
SS	17	"	140	=
?	32	"	172	=
SS	12	"	184	=

942. *Well No.* 6.

Under same bluffs as Nos. 2 and 4, and about 20 rods above No. 5, on south side of creek.

Well mouth above ocean in feet				
?	52	to	52	=
SS	34	"	86	=
?	10	"	96	=
SS	40	"	136	=
?	14	"	150	=
SS	7	"	157	=
?	4	"	161	=
SS	18	"	179	=
?	25	"	204	=
SS	14	"	218	=

GROUP 12.

GREAT REPUBLIC.

The following six wells on the Great Republic Oil Company's tract are on Upper Cherry run, Oil Creek township, Venango Co., 4 miles south-west of Pleasantville:

943. *Lambert Well No. 3.*

Authority, Jonathan Watson.

Well mouth above ocean in feet				
Drive pipe	48	to	48	=
SS., with large water course	9	"	57	=
Soapstone	143	"	200	=
Hard slate	33	"	233	=
Streak of soapstone and slate	35	"	268	=
SS.	5	"	273	=
Hard slate	25	"	298	=
Soapstone, muddy	24	"	322	=
Hard blue slate	58	"	380	=
Purple slate	58	"	438	=
Slate	39	"	477	=
SS. (strong smell of oil)	9	"	486	=
Soapstone	11	"	497	=
Soapstone and SS	49	"	546	=
Hard slate, mud vein	4	"	550	=
Soapstone and slate	25	"	575	=
SS., small pebbles	9	"	584	=
Hard blue slate and SS	7	"	591	=
Soapstone, very muddy	28	"	619	=
White SS.	22	"	641	=
Soapstone	77	"	718	=
Yellow pebbles	3	"	721	=
Dark gray SS	15	"	736	=
Soapstone	19	"	755	=
Pebbly SS	15	"	770	=
Soapstone and slate	30	"	800	=

944. *Bunker Hill Well.*

Authority, Jonathan Watson.

Well mouth above ocean in feet				
Drive pipe	113	to	113	=
SS., light brown	14	"	127	=
SS., white	9	"	136	=
SS., dark blue	4	"	140	=
SS., light gray	9	"	149	=
Slate rock	15	"	164	=
SS., light gray	8	"	172	=
Slate and soapstone rock	89	"	261	=
Slate, hard	14	"	275	=
Slate, soft	10	"	285	=
Slate, hard	20	"	305	=
SS.	9	"	314	=
Slate	26	"	340	=
Slate streaked with SS	29	"	369	=
Soapstone	7	"	376	=
Slate, hard	48	"	424	=

Slate, red	29	to	453	=
Slate, hard blue	23	"	476	=
Slate, red	16	"	492	=
SS	3	"	495	=
Slate, hard	35	"	530	=
SS., dark	40	"	570	=
Slate	14	"	584	=
Soapstone	26	"	610	=
SS. (good show of oil)	14	"	624	=
Soapstone, mud vein	36	"	660	=
SS., fine and white	32	"	692	=
Soapstone	59	"	751	=
Slate	23	"	774	=
SS., dark	10	"	784	=
Slate	9	"	793	=
SS	2	"	795	=
Slate and soapstone	11	"	806	—
SS., pebble	9	"	815	=
Soapstone	1	"	816	=

945. *Well No.* 1.

1869.

Authority, James Pettigrew, Supt.

Well mouth above ocean in feet				
Drive pipe	45	to	45	=
Mountain SS.	84	"	129	=
Slate, shelly	140	"	269	=
SS., white and hard	30	"	299	=
Slate, blue and purple	203	"	502	=
2d SS	45	"	547	=
Slate and soapstone	98	"	645	=
3d SS	27	"	672	=
Soapstone	69	"	741	=
4th SS. (oil near the top)	14	"	755	=
Slate	29	"	784	=
5th SS. (no oil)	17	"	801	=
Slate ... pocket,	9	"	810	=

Cased at 432′. Best production, 9 barrels per day. Bl oil.

946. *Well No.* 2

1869. ?

Authority, Jas. Pettigrew, Supt.

Well mouth above ocean in feet				
Drive pipe	40	to	40	—
Sandstone	80	"	120	=
Slate, hard	141	"	261	=

1st SS	29	to	290	=
Slate and soapstone	204	"	494	=
2d SS	30	"	524	=
Slate, blue and purple	109	"	633	=
3d SS	30	"	663	=
Slate	71	"	734	=
4th SS. (oil)	12	"	746	=
Slate	31	"	777	=
5th SS. (oil)	14	"	791	=
Slate	39	"	830	=

Production, 5 barrels per day, of mixed oil, part black, part green.

947. *Well No.* 3.

March, 1870.

Authority, Jas. Pettigrew, Supt.

Well mouth above ocean in feet				
Drive pipe (8″)	41	to	41	=
Mountain sand	84	"	125	=
Slate, hard	129	"	254	=
Sandstone, very hard	20	"	274	=
Soapstone (blue) and purple slate	215	"	489	=
2d SS	14	"	503	=
Slate	18	"	521	=
Sand (extra)	10	"	531	=
Slate, shelly	96	"	627	=
3d SS	23	"	650	=
Slate, hard streaks	77	"	727	=
4th SS (gas)	13	"	740	=
Slate, hard	28	"	768	=
5th SS., pebbly	18	"	786	=
Slate, black	11	"	797	=

Cased at 397′. Production, 30 barrels per day of green oil for a short time.

948. *Well No.* 4.

Authority, Jas Pettigrew, Supt.

Well mouth above ocean in feet				
Drive pipe	48	to	48	=
Mountain sand	82	"	130	=
Slate	138	"	268	=
1st SS	18	"	286	=
Slate, blue and purple	218	"	504	=
2d SS	12	"	516	=
Slate, blue and hard	10	"	526	=
Sand, dark (salt water and oil show)	10	"	536	=

Slate, blue and purple, soft	107	to	643	=
3d SS. (green oil)	26	"	669	=
Slate and soapstone	73	"	742	=
4th SS	16	"	758	=
Slate	26	"	784	=
5th SS. (good show of green oil)	15	"	799	=
Slate	9	"	808	=

CHAPTER VI

OIL CREEK.

GROUP 1.

CALDWELL FARM.

(5 *wells.*)

Wells on the Caldwell farm, Oil creek, near Pioneer. Authority, Mr. Chapin, Superintendent in 1870.

949. *Well No.* 4, *Lease No.* 12.

Well mouth above ocean in feet				
? (Interval unknown)	**212**	**to**	**212**	**=**
1st SS. (First Sandstone)........estimated	**15**	**"**	**227**	**=**
?	**115**	**"**	**342**	**=**
2d SS., estimated	**25**	**"**	**367**	**=**
?	**110**	**"**	**477**	**=**
Stray SS., estimated	**10**	**"**	**487**	**=**
?	**5**	**"**	**492**	**=**
3d SS., estimated	**40**	**"**	**532**	**=**

Wet hole. Black oil in the stray SS. This well was about 60′ above the "flats" of Oil creek on which No. 18 was located.

950. *Well, Lease* 18.

Near the creek.

Well mouth above ocean in feet				
?	**158**	**to**	**158**	**=**
1st SS., estimated	**15**	**"**	**173**	**=**
?	**123**	**"**	**296**	**=**
2d SS., estimated	**25**	**"**	**321**	**=**
?	**74**	**"**	**395**	**=**
Stray SS	**6**	**"**	**401**	**=**
?	**30**	**"**	**431**	**=**
3d SS., estimated	**40**	**"**	**471**	**=**

Wet hole. Green oil.

951. *Lower Craft Well, Lease No.* 16.

Well mouth above ocean in feet				
? (Interval unknown)	214	to	214	=
1st SS. (First Sandstone) estimated	15	"	229	=
?	121	"	350	=
2d SS., estimated	25	"	375	=
? (including stray)	109	"	484	=
3d SS	16	"	500	=

Wet hole. Produced at first testing at the rate of 30 barrels per day, but apparently clogged with mud and stopped pumping. After standing still a long time in this shape it was finally abandoned without further test. This well was about 53′ above No. 18.

952. *Upper Craft Well, Lease No.* 15.

Well mouth above ocean in feet				
?	275	to	275	=
1st SS., estimated	15	"	290	=
?	120	"	410	=
2d SS., estimated	25	"	435	=
?	110	"	545	=
3d SS., not through	15	"	560	=

Wet hole. Elevation about 115′ above No. 18

953. *Autumn Well or "Mary Ann."*

1869.

Situated on gore lease No. 17, Caldwell farm. Authority, Mr. Schuyler, owner.

Well mouth above ocean in feet				
Drive pipe	35	to	35	=
?	132	"	167	=
1st SS	16	"	183	=
?	121	"	304	=
2d SS	24	"	328	=
?	76	"	404	—
Stray SS	10	"	414	=
?	22	"	436	=
3d SS., not through the sand	41	"	477	=

Wet hole, 5¼″ diameter. Cased at ———. Gas and oil at 440′ and 468′. Elevation about 9′ above No. 18.

This well on the first test, which was very thorough and protracted, produced nothing but water. It was abandoned and lay idle for about one year, everything about the well remaining just as when the pump stopped. At the end of that time it changed hands, and the purchasers filled the boiler, fired up and started the walking-beam, when the well immediately pumped six barrels of black oil. It then commenced to pump brackish water at the rate of about 200 barrels per day. This continued about 12 hours, when a scum of green oil appeared which increased in the next 24 hours to 15 barrels per day. After this the well would produce about 15 barrels of oil and 200 barrels of water per day if pumped very rapidly (say 130 strokes per minute), and not more than 5 or 6 barrels of oil if run at the rate of 80 strokes per minute. The fast motion constantly broke the machinery, and the well was not a financial success. As a last resort a torpedo was exploded in the 3d SS., which brought the production up to 60 barrels. At the end of a month it had decreased to 20 barrels, but a torpedo again brought it up to 50 barrels. This process was repeated monthly for about a year, when the oil failed in consequence of the flooding of other wells on the flat with which this was undoubtedly connected. The pumping of these wells on the flat during the year the Mary Ann was idle explains the mystery of its producing oil after having been abandoned as a flooded well.

CHAPTER VII.

Titusville, Pine Creek and Church Run.

Records of 8 oil wells on the Parker farm, Titusville, furnished by the owner, Jonathan Watson.

954. *Logan Well.*

Well mouth above ocean in feet					
? (Interval unknown)	708	to	708	=	
3d SS. (Third Sandstone) estimated	50	"	758	=	
? pocket,	17	"	775	=	

955. *M'Cambridge Well.*

Well mouth above ocean in feet					
?	189	to	189	=	
1st SS. (estimated)	30	"	219	=	
?	179	"	398	=	
2d SS	22	"	420	=	
? (including 3d SS.)	81	"	501	=	

956. *Parker Well, No. 2.*

Well mouth above ocean in feet					
?	450	to	450	=	
1st SS., estimated	20	"	470	=	
?	199	"	669	=	
2d SS	43	"	712	=	
?	2	"	714	=	
3d SS	55	"	769	=	
?	5½	"	774½	=	

957. *Parker Well, No. 3.*

Well mouth above ocean in feet					1532
Drive pipe	36	to	36	=	1496
?	434	"	470	=	1062

1st SS.	18	to	488	=	1044
?	202	"	690	=	842
2d SS.	38	"	728	=	804
?	2	"	730	=	802
3d SS.	58	"	788	=	744
? pocket,	2	"	790	=	742

958. *Parker Well, No.* 4.

Well mouth above ocean in feet					
? (Interval unknown)	697	to	697	=	
3d SS. (Third Sandstone)	61	"	758	=	

959. *Parker Well, No.* 8.

Well mouth above ocean in feet					
Drive pipe	27	to	27	=	
?	285	"	312	=	
1st SS.	30	"	342	=	
?	188	"	530	=	
2d SS.	40	"	570	=	
?	1	"	571	=	
3d SS.	45	"	616	=	

Drilled dry. Cased at 190′.

960. *Parker Well, No.* 9.

Well mouth above ocean in feet					
? (including 1st SS.)	572	to	572	=	
2d SS.	39	"	611	=	
?	1	"	612	=	
3d SS.	55	"	667	=	

Drilled dry. Cased at 233′.

961. *Parker Well, No.* 10.

Well mouth above ocean in feet					
?	280	to	280	=	
1st SS.	37	"	317	=	
?	188	"	505	=	
2d SS.	31	"	536	=	
?	6	"	542	=	
3d SS.	57	"	599	=	

Drilled dry. Cased at 218′.

962. *Sadorus Well, No.* 1.

Sadorus farm, Pine creek, 2 miles east of Titusville. Authority, Jonathan Watson.

Well mouth above ocean in feet					
Drive pipe	36	to	36	=	
? Interval unknown)	140	"	176	=	
1st SS. (First Sandstone)	28	"	204	=	
?	180	"	384	=	
2d SS	15	"	399	=	
?	13	"	412	=	
3d SS	18	"	430	=	

963. *Duncan Well, No.* 3.

Duncan farm, Pine creek, 2 miles east of Titusville. Authority, Jonathan Watson.

Well mouth above ocean in feet					
?	255	to	255	=	
1st SS	35	"	290	=	
?	205	"	495	=	
2d SS	10	"	505	=	
?	31	"	536	=	
3d SS	27	"	563	=	

964. *Duncan Well, No.* 6.

Duncan farm, Pine creek, 2 miles east of Titusville. Authority, Jonathan Watson.

Well mouth above ocean in feet					
?	212	to	212	=	
1st SS	35	"	247	=	
?	229	"	476	=	
3d SS	61	"	537	=	

965. *M'Cort, No.* 5.

M'Guire farm, Church run. Authority, John M'Cort.

Well mouth above ocean in feet					1604
Drive pipe	30	to	30	=	1574
?	430	"	460	=	1144
1st SS	40	"	500	=	1104
?	210	"	710	=	894
2d SS	15	"	725	=	879
?	25	"	750	=	854
3d SS	64	"	814	=	790

966. *Orleans Well.*

Weed farm, Church run. Authority, Jonathan Watson.

Well mouth above ocean in feet				
? (Interval unknown)	364	to	364	=
1st SS. (First Sandstone)........estimated	40	"	404	=
?	193	"	597	=
2d SS. (estimated)	18	"	615	=
?	8	"	623	=
3d SS	75	"	698	=

967. *Mount Hope Well.*

Barnsdall farm, Church run. Authority, Jonathan Watson.

Well mouth above ocean in feet				
?	463	to	463	=
1st SS. (estimated)	40	"	503	=
?	169	"	672	=
2d SS. (estimated)	18	"	690	=
?	15	"	705	=
3d SS	62	"	767	=

968. *Peninsular Oil Co.'s Well.*

On the C. A. Davidson tract, Gilson run, or north branch of Hyde creek, about 3 miles north-north-west of Titusville. Authority, S. Minor.

Well mouth above ocean in feet				
Drive pipe	32	to	32	=
Soapstone	230	"	262	=
Red rock	10	"	272	=
Soapstone	35	"	307	=
Sandstone, white	20	"	327	=
Soapstone	205	"	532	=
Sandstone	21	"	553	=
Soapstone	29	"	582	=

Wet hole. Fresh water crevice at 80′. Gas in bottom of red rock at 272′, and again at 295′. Gas, salt water and some oil in the last sandrock.

969. *Vine Hill Well.*

1870.

At Grey's Mills, Oil Creek township, Crawford county, six miles north-west of Titusville. Authority, J S. Grey.

Well mouth above ocean in feet				
Drive pipe	47	to	47	=

Sandstone, shaly	30	to	77	—
Shale, blue	75	"	152	=
Slate, red	17	"	169	=
"Marine limestone"	25	"	194	=
Shale, blue	64	"	258	=
Sandstone, white	41	"	299	=
Slate, blue	50	"	349	=
Shale, top gray, bottom blue	87	"	436	=
Slate, gray	43	"	479	=
Sandstone, pebbly	12	"	491	=
Shale, gray and sandy, with fossil shells	75	"	566	=
Shale, blue and flinty	30	"	596	=
Shale, red, mixed with blue slate	375	"	971	=

Although this well was not "dry cased" there was not enough water in the hole to drill with. It was tubed and pumped several weeks, but yielded no oil. After exploding a torpedo in the white sand, at about 280′, it produced some gas and perhaps a barrel of oil per day.

970. *Morse, Emerson & Joy Well.*

M'Knight farm, Church run, two miles north-east of Titusville, Authority, S. Minor.

Well mouth above ocean in feet				
? (Interval unknown)	400	to	400	=
1st SS. (First Sandstone.)	60	"	460	=
?	169	"	629	=
2d SS	15	"	644	=
?	15	"	659	=
3d SS	65	"	724	=
? pocket,	12	"	736	=

Production, 75 barrels per day. Mud vein at 694′.

971. *Well No.* 4.

Guild farm. Situated about 1½ miles east of Titusville and 6 rods south of Plank road. Authority, S. Minor.

? (seed bag at 150′)	150	to	150	=
1st SS	25	"	175	=
?	243	"	418	=
2d SS	40	"	458	=
? pocket,	33	"	491	=

CHAPTER VIII.

CASHUP

Records of 9 wells belonging to A. H. Bronson, at Cashup, 4½ miles south-east of Pleasantville. Copied from the superintendent's books.

972. *Well No.* 1.

Well mouth above ocean in feet					
? (Interval unknown)	884	to	884	=	
4th SS. (Fourth Sandstone)	19	"	903	=	

973. *Well No.* 2.

Well mouth above ocean in feet					1653
?	896	to	896	=	757
4th SS	19	"	915	=	738
Slate pocket,	20	"	935	=	718

974. *Well No.* 3.

Well mouth above ocean in feet					
?	898	to	898	=	
4th SS	19	"	917	=	
Slate pocket,	20	"	937	=	

975. *Well No.* 4.

Well mouth above ocean in feet					1655
?	904	to	904	=	751
4th SS., said to be wanting.					

Full depth of well not reported.

976. *Well No.* 5.

Well mouth above ocean in feet					1657
?	900	to	900	=	757
4th SS	16	"	916	=	741

977. *Well No.* 6.

Well mouth above ocean in feet					**1646**
? (Interval unknown)	**891**	**to**	**891**	**=**	**755**
4th SS. (Fourth Sandstone)	**18**	**“**	**909**	**=**	**737**

978. *Well No.* 7.

Well mouth above ocean in feet					**1640**
?	**886**	**to**	**886**	**=**	**754**
4th SS	**17**	**“**	**903**	**=**	**737**

979. *Well No.* 8.

Well mouth above ocean in feet					**1634**
?	**878**	**to**	**878**	**=**	**756**
4th SS	**18**	**“**	**896**	**=**	**738**

980. *Well No.* 10.

Well mouth above ocean in feet					**1639**
?	**1020**	**to**	**1020**	**=**	**619**

No detailed record was kept of this well, but it was put down, as will be observed by the tide level of the bottom, about 120′ below the 4th SS. No sands were found below the 4th, except a band of gray shells at about 945′.

981. *Holmes & Brown Well, No.* 1.

1871.

East end of Harsh tract, Cashup, 4½ miles south-east of Pleasantville. Authority, A. W. Brown.

Well mouth above ocean in feet					**1611**
?	**357**	**to**	**357**	**=**	**1254**
1st SS	**34**	**“**	**391**	**=**	**1220**
?	**204**	**“**	**595**	**=**	**1016**
2d SS	**23**	**“**	**618**	**=**	**993**
?	**82**	**“**	**700**	**=**	**911**
Stray-3d SS	**20**	**“**	**720**	**=**	**891**
?	**16**	**“**	**736**	**=**	**875**
3d SS	**38**	**“**	**774**	**=**	**837**
?	**71**	**“**	**845**	**=**	**766**
4th SS	**25**	**“**	**870**	**=**	**741**
? pocket,	**13**	**“**	**883**	**=**	**728**

Drilled dry. This was the first well put down at Cashup. It was a little north of the best producing territory as afterwards

developed. It commenced pumping at the rate of 4 or 5 barrels per day, gradually increasing to 20 barrels, and then running down quickly to almost nothing when the wells on the centre of the deposit began to exhaust the oil.

982. *Kratzer Well, No.* 1.

Brown lease, Cashup, 4½ miles south-east of Pleasantville, Authority, P. Kratzer.

Well mouth above ocean in feet					1614
? (Interval unknown)	590	to	590	=	1024
2d SS. (Second Sandstone)	25	"	615	=	999
?	70	"	685	=	929
3d SS. (in two members)	88	"	773	=	841
?	72	"	845	=	769
4th SS. (5′ of top gray)	21	"	866	=	748
? pocket,	11	"	877	=	737

983. *M'Laughlin Well, No.* 1.

1871.

Cashup, 4½ miles southeast of Pleasantville. Authority, T. M'Laughlin.

Well mouth above ocean in feet					1640
?	178	to	178	=	1462
Mountain SS., estimated	40	"	218	=	1422
?	378	"	596	=	1044
2d SS	65	"	661	=	979
? (including some red rock)	190	"	851	=	789
Black sand and slate	10	"	861	=	779
4th SS	30	"	891	=	749

Drilled dry. Cased at 224′.

Heavy flow of gas in 2d SS. Production, about 1,000 barrels per day for a short time. The Cashup pool of oil proved to be small, and all the wells soon settled down to small pumpers.

984. *Harsh Well, No.* 6.

Harsh tract, Cashup, 4½ miles south-east of Pleasantville.

Well mouth above ocean in feet					1569
?	325	to	325	=	1244
SS.	19	"	344	=	1225
?	214	"	558	=	1011

SS. (Sandstone)		36	to	594	=	975
? (Interval unknown)		64	"	658	=	911
SS	2d SS. in 3 members.	22	"	680	=	889
Slate		20	"	700	=	869
SS		10	"	710	=	859
Slate		5	"	715	=	854
SS		20	"	735	=	834
?		69	"	804	=	765
3d SS		20	"	824	=	745

CHAPTER IX.

Tidioute; Triumph; Fagundus; New London; &c.

GROUP 1.

ECONOMY.

Records of 10 wells belonging to the Economy company, situated on various parts of their tract in Limestone township, Warren Co., south of the Allegheny river at Tidioute. Copied by permission from the company's books.

985. *Well No.* 4.

On the hill 1¼ miles south of river.

Well mouth above ocean in feet				
? (Interval unknown)	190	to	190	=
1st SS. (First Sandstone)	20	"	210	=
?	315	"	525	=
2d SS	35	"	560	=
?	20	"	580	=
Stray 3d SS	16	"	596	=
?	76	"	672	=
3d SS	18	"	690	=
? pocket,	7	"	697	=

Mud at 674′ and 680′.

986. *Well No.* 6.

On the hill near the river.

Well mouth above ocean in feet				
Conductor	26	to	26	=
?	139	"	165	=
1st SS	8	"	173	=
?	139	"	312	=
2d SS	18	"	330	=
?	78	"	408	=
3d SS	23	"	431	=

987. *Good Will Well.*

Near the above (No. 6).

Well mouth above ocean in feet				
? (Interval unknown)	**260**	**to**	**260**	=
1st SS. (First Sandstone)	**10**	"	**270**	=
?	**42**	"	**312**	=
2d SS	**18**	"	**330**	=
?	**79**	"	**409**	=
3d SS	**27**	"	**436**	=

988. *Well M, or Gas Well.*

On Dennis run, 1¼ miles south of river.

Well mouth above ocean in feet				
?	**106**	**to**	**106**	=
1st SS	**15**	"	**121**	=
?	**79**	"	**200**	=
2d SS	**16**	"	**216**	=
?	**76**	"	**292**	=
3d SS	**6**	"	**298**	=
?	**38**	"	**336**	=
4th SS. (oil sand)	**10**	"	**346**	=
?	**114**	"	**460**	=
Red rock	**5**	"	**465**	=
?	**194**	"	**659**	=

The flow of gas comes in the well at 520′.

989 *Well N.*

Dennis run, ¼ of a mile from river.

Well mouth above ocean in feet				
?	50	to	50	=
1st SS., estimated	15	"	65	=
?	54	"	119	=
2d SS	9	"	128	=
?	79	"	207	=
3d SS	11	"	218	=
?	652	"	870	=
Hard shell of sand	8	"	878	=
?	127	"	1005	=

990. *Shingle Mill Well, No.* 1.

Lower end of tract No. 5206.

Well mouth above ocean in feet				
?	166	to	166	=
1st SS	8	"	174	=

?	9	to	183	=
2d SS	7	"	190	=
?	10	"	200	=
Stray 3d SS	6	"	206	=
Red rock	5	"	211	=
?	8	"	219	=
4th SS	24	"	243	=
?	28	"	271	=
5th SS	11	"	282	=
?	117	"	399	=

This well was unproductive.

991. *Shingle Mill Well, No.* 2.

Five miles east of Tidioute bridge and 2 miles south of river, on Tract No. 5206.

Well mouth above ocean in feet				
? (Interval unknown)	283	to	283	=
1st SS. (First Sandstone)	20	"	303	=
?	35	"	338	=
2d SS	14	"	352	=
?	15	"	367	=
3d SS	12	"	379	=
?	6	"	385	=
4th SS	9	"	394	=
?	34	"	428	=
5th SS. (mud at 440′)	32	"	460	=
?	60	"	520	=
Pebble shell, estimated	3	"	523	=
?	33	"	556	=

992. *Centre Well.*

On tract No. 5277, 1½ miles south-east of Tidioute bridge.

Well mouth above ocean in feet				
Conductor	43	to	43	=
?	23	"	66	=
Mountain sand	12	"	78	=
?	295	"	373	=
Red rock	3	"	376	=
1st SS., shelly (estimated)	20	"	396	=
?	57	"	453	=
2d SS. (estimated)	30	"	483	=
?	57	"	540	=
3d SS	22	"	562	=

Water at 71′. Oil at 544′. Mud vein at 555′.

993. *Well No.* 15, *A.*

One mile from the river.

Well mouth above ocean in feet				
? (Interval unknown)	60	to	60	=
1st SS. (First Sandstone)......estimated	20	"	80	=
?	314	"	394	=
2d SS	16	"	410	=
?	43	"	453	=
Stray 3d SS	15	"	468	=
?	76	"	544	=
4th SS	14	"	558	=
?	16	"	574	=

994. "*Dry Hole*" *Well.*

1876.

On tract No. 5205, 3¾ miles south-east from Tidioute bridge, and near the Warren and Tionesta road.

Well mouth above ocean in feet				
Conductor	27	to	27	=
?	503	"	530	=
1st SS., estimated	20	"	550	=
Red rock	5	"	555	=
?	35	"	590	=
Stray 3d SS	30	"	620	=
?	75	"	695	=
3d SS., estimated	5	"	700	=
?	43	"	743	=

The 3d SS. was only a thin band of sandy shells.

GROUP 2.

TRIUMPH.

Partial records of some of Radure & Watson's wells on land of Triumph Oil Company, Triumph Hill, Warren county, near Tidioute. Authority, superintendent's books.

995. *Lease* 126.

Well mouth above ocean in feet				
?	698	to	698	=
3d SS	87	"	785	=

996. *Lease* 224.

Well mouth above ocean in feet				
?	425	"	425	=
1st SS.	25	"	450	=
? (including 2d SS.)	225	"	675	=
3d SS	84	"	759	=

997. *Lease* 149.

Well mouth above ocean in feet				
?	700	to	700	=
3d SS	103	"	803	=

On lease 237 the 3d SS. was 106′ thick.

On lease 101 the 3d SS. was only 8′ thick.

A well drilled 105′ below the 3d SS. found only soft drilling the whole distance. No other sandstone discovered.

998. *Well No.* 49, *D.*

1866.

N. Y. and Allegheny tract, Deerfield township, Warren county. Authority, William W. Hague.

Well mouth above ocean in feet				
Conductor	8	to	8	=
Slate	23	"	31	=
Sandstone	29	"	60	=
Slate	115	"	175	=
Sandstone	7	"	182	=
Slate	12	"	194	=
Sandstone	44	"	238	=
Slate	43	"	281	=
Sandstone	29	"	310	=
Slate	123	"	433	=
3d SS	113	"	546	=

Wet hole. Cased at 300′. Best production, 150 barrels per day. Gas sufficient to fire 3 boilers. Green oil. Gravity, 47°

GROUP 3.

FAGUNDUS.

Fagundus Farm Oil Company's wells; Fagundus, Warren and Forest counties, 4½ miles south-west of Tidioute. Authority, manager's books.

999. *Well No.* 1.

Well mouth above ocean in feet				
? (Interval unknown)	**222**	**to**	**222**	=
Mountain sand, estimated	**30**	"	**252**	=
?	**443**	"	**695**	=
3d SS. (Third Sandstone)	**38**	"	**733**	=
? pocket,	**11**	"	**744**	=

1000. *Well No.* 11.

Well mouth above ocean in feet				
?	**465**	**to**	**465**	=
1st SS	**10**	"	**475**	=
?	**60**	"	**535**	=
Stray 2d SS	**8**	"	**543**	=
?	**27**	"	**570**	=
2d SS	**23**	"	**593**	=
?	**25**	"	**618**	=
Stray 3d SS	**32**	"	**650**	=
?	**66**	"	**716**	=
3d SS	**33**	"	**749**	=

1001. *Well No.* 12.

Well mouth above ocean in feet				
?	**490**	**to**	**490**	=
1st SS., estimated	**10**	"	**500**	=
?	**65**	"	**565**	=
2d SS., estimated	**15**	"	**580**	=
?	**57**	"	**637**	=
Stray 3d SS., estimated	**30**	"	**667**	=
?	**63**	"	**730**	=
3d SS., estimated	**30**	"	**760**	=

1002. *Thornberg Well, No.* 2.

Beatty farm, Fagundus. Authority, Mr. Thornberg.

Well mouth above ocean in feet				
?	**380**	**to**	**380**	=
1st SS	**10**	"	**390**	=

?	40	to	430	=
2d SS	30	"	460	=
?	30	"	490	=
Stray 3d SS	20	"	510	=
?	70	"	580	=
3d SS	38	"	618	=

Thornberg Well No. 1 struck the 3d SS. at 608′ and passed through it at 641′=33′ thick.

"Red Flag" wells, Scott farm, Fagundus. Authority, the owner.

1003. *Well No.* 1.

Well mouth above ocean in feet					1702
? (Interval unknown)	290	to	290	=	1412
1st SS. (First Sandstone)......estimated	10	"	300	=	1402
?	453	"	753	=	949
3d SS	29	"	782	=	920

1004. *Well No.* 2.

Well mouth above ocean in feet				
?	305	to	305	=
1st SS., estimated	10	"	315	=
?	450	"	765	=
3d SS	30	"	795	=
?....pocket,	8	"	803	—

GROUP 4.

CLAPP FARM.

Clapp farm, between New London and Triumph, Deerfield township, Warren county, about 3 miles from Tidioute.

Thickness and depth of third sand, as found in seventeen wells on the Clapp farm. Copied from Company's books.

1005	Well No. 1	18′ thick;	from	631	to	649	=	1575
1006	" No. 3	30′ "	"	628	"	658	—	1561
1007	" No. 8	20′ "	"	697	"	717	=	?
1008	" No. 15	15′ "	"	712	"	727	=	?
1009	" No. 16	25′ "	"	688	"	713	=	1628

1010	Well No. 17	20′	thick;	from	676	to	696	=	?
1011	" No. 18	14′	"	"	692	"	706	=	?
1012	" No. 31	32′	"	"	713	"	745	=	?
1013	" No. 32	41′	"	"	700	"	741	=	?
1014	" No. 33	39′	"	"	770	"	809	=	1700
1015	" No. 34	38′	"	"	793	"	831	=	1729
1016	" No. 35	54′	"	"	784	"	838	=	1744
1017	" No. 43	18′	"	"	714	"	732	=	1648
1018	" No. 50	46′	"	"	658	"	704	=	1601
1019	" No. 51	50	"	"	714	"	764	=	1619
1020	" No. 52	48′	"	"	674	"	722	=	1616
1021	" No. 53	45′	"	"	662	"	707	=	1603

GROUP 5.

MISCELLANEOUS.

1022. *Schmick Well, No.* 1.

Irvin farm, between Colorado and New London, Deerfield township, Warren county. Authority, Peter Schmick.

Well mouth above ocean in feet					1519
? (Interval unknown)	155	to	155	=	1364
SS. (Sandstone)	11	"	166	=	1353
?	234	"	400	=	1119
SS	10	"	410	=	1109
?	80	"	490	=	1029
SS	15	"	505	=	1014
?	25	"	530	=	989
SS	20	"	550	=	969
?	80	"	630	=	889
SS	45	"	675	=	844
? pocket,	15	"	690	=	829

Drilled dry. A good well, as were all others in this vicinity.

1023. *Neill Well.*

South-east corner of South-west township, Warren county, on the hill between Neilltown and Funk's Mills, and 1½ miles north of Neilltown. Put down about 1871. Record given from memory by one of the drillers.

Well mouth above ocean in feet					
?	380	to	380	=	
1st SS., estimated	60	"	440	=	

?	140	to	580	=
2d SS., estimated	40	"	620	=
?	115	"	735	=
Stray SS	20	"	755	=
?	25	"	780	=
3d SS	25	"	805	=
?	75	"	880	=
4th SS	7	"	887	=
? (soft measures, no sandstone)	113	"	1000	=

Drilled dry. Unproductive.

1024. *M'Laughlin Well.*

May, 1876.

On Marshall farm, Allegheny township, Venango county, 5 miles S. E. of Pleasantville. Authority, Tobias M'Laughlin.

Well mouth above ocean in feet				
Conductor	10	to	10	=
SS	30	"	40	=
Slate and shale	140	"	180	=
SS	58	"	238	=
? (Interval unknown)	127	"	365	=
1st SS. (First Sandstone)	32	"	397	=
?	233	"	630	=
2d SS	20	"	650	=
?	113	"	763	=
3d SS., shells	74	"	837	=
Slate	30	"	867	=
Stray SS. (4th)	9	"	876	=
Slate	30	"	906	=
5th SS	2	"	908	=
Slate	17	"	925	=

Drilled dry. Cased at 292'. Not tubed. No oil.

1025. *Dawson, No.* 3.

About 1865.

On Dawson farm, Allegheny township, Venango county, 6 miles south-east of Pleasantville. Authority, John's History of Petrolia, p. 445.

Well mouth above ocean in feet				
?	119	to	119	=
SS., gray	18	"	137	=
?	94	"	231	=
SS., gray	7	"	238	=
?	136	"	374	=
SS., gray	16	"	390	=

?	3	to	393	=
SS., gray	22	"	415	=
?	16	"	431	=
SS	19	"	450	=
?	5	"	455	=
SS	11	"	466	=
?	7	"	473	=
SS., white	12	"	485	=
?	23	"	508	=
SS	5	"	513	=
?	11	"	524	=
SS., gray and red	20	"	544	=
?	70	"	614	=
SS., gray	5	"	619	=

CHAPTER X.

VICINITY OF PLEASANTVILLE, TITUSVILLE AND ROUSEVILLE.

1026. *Harmonial Well, No.* 1.

1868.

Porter farm, borough of Pleasantville. Authority, S. Minor.

Well mouth above ocean in feet					1620
? (Interval unknown)	132	to	132	=	1488
1st SS. (First Sandstone)	70	"	202	=	1418
?	146	"	348	=	1272
2d SS	12	"	360	=	1260
?	216	"	576	=	1044
3d SS	40	"	616	=	1004
?	91	"	707	=	913
4th SS	40	"	747	=	873
?	65	"	812	=	808
5th SS	18	"	830	=	790
? pocket,	5	"	835	=	785

[A record of this well was published in the Nettleton collection. The one here given was obtained no doubt by Mr. Minor from the drillers at the well, and we insert it because it shows two mountain sands not mentioned in the other record. The ocean level is also raised 6′, to correspond with our elevations established since the first publication.]

1027. *M'Laughlin Well.*

July, 1875.

Small farm, on the road from Pleasantville to Enterprise, and near the north line of the borough of Pleasantville. Authority, T. M'Laughlin.

Well mouth above ocean in feet					1586
?	540	to	540	=	1046
1st SS., estimated	20	"	560	=	1026

?	100	to	660	=	926
2d SS	34	"	694	=	892
?	70	"	764	=	822
3d SS	9	"	773	=	813
?	30	"	803	=	783
4th SS	25	"	828	=	758
?	7	"	835	=	751

Drilled dry. A little dark oil sand-pumped. The well was never tubed, as the indications for oil would not warrant the expense. Before the engine was taken away it was drilled about 30′ deeper than given above, in quest of another sand, but nothing but soft rocks was found.

1028. *Lambert Well, No.* 1.

Baum farm, 1½ miles south-west of Pleasantville. Authority, Jonathan Watson.

Well mouth above ocean in feet					
? (Interval unknown)	454	to	454	=	
2d SS. (Second Sandstone) .... estimated	40	"	494	=	
?	221	"	715	=	
3d SS	40	"	755	=	
?	45	"	800	=	

1029. *Johnson Well.*

February, 1877.

On land of A. W. Brown, near the south-west corner of borough of Pleasantville. Authority, Jesse Johnson, owner.

Well mouth above ocean in feet					
Conductor	20	to	20	=	
Slate, gray	10	"	30	=	
SS., very hard	40	"	70	=	
Slate, ordinary	110	"	180	=	
Mt. SS	60	"	240	=	
Slate	160	"	400	=	
SS., gray, hard	30	"	430	=	
Slate and shells, hard drilling	215	"	645	=	
2d SS. (oil and gas at 684′)	45	"	690	=	
Slate	90	"	780	=	
3d SS	23	"	803	=	
Slate	82	"	885	=	
4th SS., yellow pebbles and a little oil	6	"	891	=	
Slate	25	"	916	=	
5th SS., black sand and pebbles 2′, fine-grained sand 25′	27	"	943	=	
Slate	20	"	963	=	

No red rock in any part. A little salt water in 3d SS. Unproductive.

1030. *M'Caslin Well, No.* 1.

1865.

John M'Caslin farm, 1 mile south-west of Pleasantville, on road to Jerusalem Corners.

Well mouth above ocean in feet				
Drive pipe	40	to	40	=
? (Interval unknown)	50	"	90	=
1st SS. (water vein 2' 8'' at 180')	89	"	179	=
?	261	"	440	=
Clay slate	160	"	600	=
2d SS. (Second Sandstone)	3	"	603	=
Clay slate	30	"	633	=

Wet hole. Seed bag on tubing at 580'.

[Produced several barrels of amber oil.]

1031. *Dickson Well.*

1876.

On the John Gregg farm, Oil Creek township, Venango Co., 2 miles south-east of Titusville. Authority, Joseph Dickson.

Well mouth above ocean in feet				
?	540	to	540	=
Stray SS., white and fine	15	"	555	=
Slate	15	"	570	=
3d SS	18	"	588	=
Slate pocket,	8	"	596	=

Drilled dry. Best production, 2 barrels per day. Green oil. Very little gas.

No well defined sands were found in this well until the Stray was struck. The upper sands were represented only by bands of shells. The 3d SS. was very good, but the usual order of pebble and sand was reversed, the fine sand being at the top of the rock and the pebbles at the bottom.

1032. *Wray Well.*

1874.

On the Original Petroleum Company's tract, Oil creek, 1 mile below Titusville, and a short distance below the pioneer "Drake Well." The derrick floor was about 75′ above the creek level. Authority, D. A. Wray.

Well mouth above ocean in feet				
Conductor, estimated	**10**	**to**	**10**	=
Slate	**20**	**"**	**30**	=
Slate, with very hard shells	**55**	**"**	**85**	=
Slate and shale, softer	**55**	**"**	**140**	=
Red rock, estimated	**10**	**"**	**150**	=
Hard shells	**20**	**"**	**170**	=
Slate	**41**	**"**	**211**	=
1st SS., coarse and soft	**48**	**"**	**259**	=
? (Interval unknown)......good drilling	**174**	**"**	**433**	=
2d SS. (Second Sandstone)	**25**	**"**	**458**	=
Slate	**15**	**"**	**473**	=
3d SS., first 20′ very good pebble sand	**42**	**"**	**515**	=
Slate ... pocket,	**10**	**"**	**525**	=

Drilled dry. Cased at 170′. Started to pump at the rate of 5 barrels per day, but fell off rapidly. Exploded two torpedoes in the well and pumped it faithfully for a month, but it failed to pay expenses and was abandoned.

1033. *Original Petroleum Company's Well, No. 2.*

Original Petroleum Company's farm, Oil creek township, Venango county. Authority, ——.

Well mouth above ocean in feet				
?	109	to	109	=
Slate, hard; good show of oil, some gas	16	"	125	=
SS., gray	3	"	128	=
Slate, very hard blue rock	7	"	135	=
? (some show of oil)	14	"	149	=
1st SS	44	"	193	=
Fire-clay	1	"	194	=
Slate, soft	11	"	205	=
Slate, soft (good show of oil)	61	"	266	=
Slate	106	"	372	=
SS., dark blue	1	"	373	=
?	4	"	377	=
SS., dark gray	1	"	378	=
?	22	"	400	=
Slate	20	"	420	=
2d SS	20	"	440	=

Cased at 102′. Below the 2d SS. is a "light black slate."

1034. *Grant Well.*

1864.

Buchanan farm, Rouseville. Authority, Mr. Willoughby.

Well mouth above ocean in feet					1027
? (Interval unknown)	173	to	173	=	854
1st SS. (First Sandstone)	42	"	215	=	812
?	110	"	325	=	702
2d SS	28	"	353	=	674
?	117	"	470	=	557
3d SS	20	"	490	=	537

1035. *Dearborn Well.*

1864.

Buchanan farm, Rouseville. Authority, Mr. Willoughby.

Well mouth above ocean in feet, approximately					1046
?	195	to	195	=	
1st SS.	40	"	235	=	
?	110	"	345	=	
2d SS	27	"	372	=	
?	118	"	490	=	
3d SS	30	"	520	=	

1036. *Rich Well.*

October, 1876.

One mile north of Shaw farm, between Walnut Bend and Rouseville, Cornplanter township, Venango county. Authority, John S. Rich.

Well mouth above ocean in feet					
Conductor	10	to	10	=	
SS., yellow	16	"	26	=	
Slate, black	4	"	30	=	
Coal and shale	3	"	33	=	
Slate, black	6	"	39	=	
SS. shells	40	"	79	=	
SS., white	10	"	89	=	
Slate	30	"	119	=	
SS., white	12	"	131	=	
Slate and shells	60	"	191	=	
SS., white	9	"	200	=	
Slate	17	"	217	=	
SS., gray	4	"	221	=	
Shells and slate	20	"	241	=	
Slate,	11	"	252	=	
SS., close and white	47	"	299	=	
Slate	1	"	300	=	

SS., (Sandstone) gray	2	to	302	=
Slate (fresh water cased off)	11	"	313	=
SS., gray	9	"	322	=
Slate and shells	35	"	357	=
SS., gray	7	"	364	=
Slate, black	29	"	393	=
SS.	11	"	404	=
Slate	37	"	441	=
SS., shells	40	"	481	=
SS., gray	17	"	498	=
Slate, black	18	"	516	=
SS., gray	3	"	519	=
SS., shells	30	"	549	=
SS., gray	2	"	551	=
Slate, black	30	"	581	=
Slate, red	40	"	621	=
SS., shells	25	"	646	=
Slate, red	4	"	650	=
SS., shells	27	"	677	=
Slate, red	4	"	681	=
SS., shells	15	"	696	=
1st SS. (small show of oil)	60	"	756	=
SS., shells	20	"	776	=
Slate, black	24	"	800	=
SS., gray	3	"	803	=
Slate, black	27	"	830	=
SS., shells	4	"	834	=
Slate, black	6	"	840	=
2d SS. (no oil)	38	"	878	=
Slate	4	"	882	=
Shell, gray	1	"	883	=
Slate	47	"	930	=
Shells	15	"	945	=
SS., gray, (a little black oil)	16	"	961	=
Slate	1	"	962	=
SS., white, (black oil filled up 200')	8	"	970	=
Slate	21	"	991	=
SS., white, some pebble	9	"	1000	=
Slate	15	"	1015	=
Shells and slate	3	"	1018	=

Drilled Dry. Cased at 313'.

Best production, 5 barrels per day. Black oil.

CHAPTER XI.

WELLS IN WARREN AND CRAWFORD COUNTIES.

1037. *Hague, or "Sheffield Gas Well."*

September, 1875.

Two and a half miles east of Sheffield, on land of Horton & Co., Sheffield township, Warren county. Authority, W. W. Hague.

Well mouth above ocean in feet, approximate					1420
Conductor	16	to	16	=	
? (Interval unknown)	164	"	180	=	
1st SS. (First Sandstone)	20	"	200	=	
?	57	"	257	=	
2d SS	18	"	275	=	
?	83	"	358	=	
Stray sand, estimated	10	"	368	=	
?	50	"	418	=	
3d SS., fine and muddy	28	"	446	=	
?	24	"	470	=	
Red rock, estimated	20	"	490	=	
?	110	"	600	=	
Red rock, estimated	20	"	620	=	
?	325	"	945	=	
Red rock, estimated	20	"	965	=	
?	80	"	1045	=	
Sandstone, estimated	10	"	1055	=	
?	295	"	1350	=	
Sandstone, reported	30	"	1380	=	
?	125	"	1505	=	
Sandstone and shale, reported	20	"	1525	=	
?	105	"	1630	=	

Drilled dry. Cased at 175′. Best production, half a barrel of oil per day. Oil green. Gravity, 49°. Gas sufficient to fire 20 boilers. Gas, salt water and a show of oil in the 3d sand (520′). Amber oil with some gas at 1045′. Great gas vein at 1350′, a few feet below which almost pure benzine was brought up in the sand-pump. Green oil at 1505′.

[The above record is very imperfect as furnished in the original blank, only the distances from the surface to the top of the sands and red rocks having been recorded. In reducing it to form, these strata have been partly estimated and partly given according to common report, and no doubt some are too thick and others too thin, but the position of the top of each corresponds to the measurements given in the blank.

It is a pity that a precise record of this well cannot be obtained, as it is widely known and talked about on account of the unusual phenomenon presented by the formation of ice in it near the point of gas inflow at 1350 feet from the top. Some have doubted this ice story, but there can be no question about it. Ice was brought up in the sand-pump while drilling in mid-summer. After completion, the well was tubed, and the tubing partly filled with water before inserting the sucker-rods. When the rods were put in, some obstruction in the tubing stopped them just above the gas vein, and they could be forced down no farther. The tubing was drawn to ascertain the cause, and several joints were found closed up solid with ice. The cold is produced no doubt by the sudden expansion of the gas as it enters the well from the rock where it has been confined under a tremendous pressure.

The gas is conveyed to the town of Sheffield by pipes from the well, where it is used for heating and illuminating purposes.]

1038. *Dingley Well.*

1874.

On lot No. 446, Warren county map, about midway along the southerly line of said lot. Authority, Capt. A. Dingley.

Well mouth above ocean in feet, about					1380?
? (Interval unknown)	575	to	575	=	
Hard shells with pebbles	5	"	580	=	
?	20	"	600	=	
Red rock, estimated	20	"	620	=	
?	66	"	686	—	
1st SS. (First Sandstone) ,estimated	20	"	706	=	
?	79	"	785	=	
2d SS	6	"	791	=	
Sand shells	9	"	800	=	
?	90	"	890	=	
Sholls of green sand	5	"	895	=	
?	30	"	925	=	
3d SS	32	"	957	—	
? pocket,	4	"	961	=	

Drilled dry. Cased at 170′. First show of gas at 540′. Best production, 2 barrels of green oil per day for one week. Torpedoed, opened a crevice and spoiled the well.

I will further state that I put down a well on lot No. 455, about 80 rods due south from the one above described, to the depth of 1200 feet, and found nothing but strata of hard and soft shale of different colors, with very hard dark blue rock during the last forty or fifty feet of the drilling.

1039. *Atlas Well.*

1867.

On Atlas Oil Company's tract, section 238, Eldred township, Warren county. Authority, Wm. W. Hague.

Well mouth, above ocean in feet					1520
? (Interval unknown)	258	to	258	=	1262
1st SS. (First Sandstone) hard, estimated	20	"	278	=	1242
?	59	"	337	=	1183
2d SS., hard, estimated	20	"	357	=	1163
?	173	"	530	=	900
3d SS., hard	48	"	578	=	942
? pocket,	10	"	588	=	932

Wet hole. Cased at 320′. Best production, 15 barrels per day. Gas sufficient to fire four well boilers. Green oil. Gravity, 46°.

1040. *Cattasaque Well.*

1865.

On tract No. 342, Eldred township, Warren county. Authority, Otis Manchester.

Well mouth above ocean in feet					
Drive pipe	11	to	11	=	
Slate	4	"	15	=	
Soapstone	78	"	93	=	
Slate, dark	149	"	242	=	
Sandstone, white; 7′ of pebble on top	28	"	270	=	
Soapstone	180	"	450	=	
Slate	35	"	485	=	
Sandstone, white and fine	6	"	491	=	
Soapstone	88	"	579	=	
Slate	41	"	620	=	
Red rock	49	"	669	=	
Soapstone	33	"	702	=	
Red rock	24	"	726	=	

Slate	74	to	800	=
Red rock	15	"	815	=
Slate	79	"	894	=
Red rock	20	"	914	=

Wet hole. Unproductive. Water at 13′, 37′, 53′, 95′, 400′ and 738′. Gas at 248′, 270′, 485′, 630′ and 800′.

1041. *Experimental Well, No.* 1.

Cotter farm, on Brokenstraw creek, Pittsfield township, Warren county, 2 miles above Garland. Authority, C. W. Hare, the present owner.

Well mouth above ocean in feet				
Conductor	13	to	13	=
Slate, blue and gritty	6	"	19	=
SS. (Sandstone) grey	2	"	21	=
Slate	11	"	32	=
SS	2	"	34	=
Slate	49	"	83	=
Shale	30	"	113	=
SS., white and flinty	40	"	153	=
Soapstone	54	"	207	=
Slate, gritty and mixed with quartz	18	"	225	=
Red rock	4	"	229	=
Soapstone	5	"	234	=
Slate, with thin white sand shell	16	"	250	=
Soapstone	43	"	293	=
SS., quartz, thick oil and gas	2	"	295	=
Soapstone oil show	35	"	330	=
SS., (crevice)	2	"	332	=
Soapstone, show of oil and soot	20	"	352	=
Slate	10	"	362	=
Soapstone	14	"	376	=
SS	4	"	380	=
? (Interval unknown)	240	"	620	=
Slate, hard	10	"	630	=
SS	5	"	635	=
Soapstone and slate	97	"	732	=
3d SS	7	"	739	=
Slate, soft and soapy	8	"	747	=

Wet hole. Seed bagged at 116′. Tested at 634′, and again at 747′. Unproductive.

Another well was put down on this farm of which no log can be found.

[This other well referred to was on an island in Brokenstraw creek, and I was informed by Mr. John Jones, lessee of the farm, who appeared to be perfectly familiar with the history of these wells, that about 200′ of drive pipe had to be driven in the island well to reach the bottom of the drift; that the well was drilled 1,000′ and then tested for two weeks. Failing to produce oil it was sunk 500′ deeper, and again tested with like results. On the last test, which was continued for 3 weeks, it showed no oil or gas but pumped about 75 barrels per day of very salt water. 1,500 feet at that time (about 1866) was a very unusual depth for a well, and it is a great pity that the record is lost. It would have given us some idea of the measures for at least 1,100′ below the horizon of the Venango oil group.—J. F. C.]

1042. "*Porkey Run*" *Well.*

1877.

S. Q. Brown farm; tract 87, Oil Creek township, Crawford county, 3 miles north-east of Titusville. Authority, Wm. F. Newton, lessee.

Well mouth above ocean in feet..................................				
Conductor (wood, 25; sheet iron, 39;)..........	39	to	39	=
SS. (Sandstone) yellow	20	"	59	=
Slate, soft..	15	"	74	=
Blue mud, running in well.....................	15	"	89	=
Slate..	101	"	190	=
1st SS...	42	"	232	=
Slate, soft soapstone and red rock	184	"	416	=
2d SS., grey....................................	22	"	438	=
Slate	20	"	458	=
Sand shells, hard and grey, no pebble.........	12	"	470	=
Slate, soft, no red	80	"	550	=

The casing had to be put in at 103′ to shut off the mud which was freely running into the well, making it almost impossible to drill. Water came in below this point, and consequently the well was drilled wet. There was a red band about 6′ thick in the lower part of the slate immediately above the 1st SS.

Unproductive.

1043. *Newton Gas Well.*

May, 1872.

On A. H. Nelson farm, Oil Creek township, Crawford county, 5½ miles north-east of Titusville. Authority, Wm. F. Newton.

Well mouth above ocean in feet				
Conductor	15	to	15	=
Sandstone	25	"	40	=
Slate	160	"	200	=
Mountain SS. (Mountain Sandstone)	30	"	230	=
Slate, partly red	245	"	475	=
1st SS	40	"	515	=
Slate and a little red rock	161	"	676	=
2d SS., stray, grey and very hard	12	"	688	=
Slate (no red)	12	"	700	=
2d SS	17	"	717	=
Slate (no red)	23	"	740	=
3d SS	40	"	780	=

The 3d SS. was white, with a slight mixture of yellow, and pebbly all the way through. There were two mud veins, one at 743′ and one at 746½′. The gas comes in in about equal quantities at these two points. This was proven by lowering the casing to 745′, which decreased the flow just about one-half, as near as could be estimated. It was then lowered to 748′, and there remained scarcely sufficient gas to run the boiler.

In the fall of 1875 salt water (very salt) accumulated in the well and interfered with the flow of gas. It was then cleaned out and tubed with one inch pipe for the purpose of keeping the salt water down. It was pumped steadily with this small pump, and on the sixth day showed some oil. On the seventh day the oil had increased and was being delivered with the water at the rate of one barrel per day. At this time the small pump rods broke, the weather was unfavorable for "overhauling," and as the water did not now interfere with the gas, the pumping stopped. It has not been pumped since, but makes some little oil now in the gas receiver. The oil appears to be the same as that produced at Church Run.

The flow of gas from this well when first struck has been estimated at 5,000,000 of cubic feet per day. In 1877 an attempt to make an accurate measurement of it was made by means of a gasometer prepared for the purpose, but the volume of gas was so great that the effort failed.

Shortly after the well was struck pipes were laid to Titusville, and the gas was introduced into many dwellings, and used by refiners and others for heating purposes. It is still used in this manner as far as the well is able to supply them. The flow has gradually decreased from the start, and is now (March, 1877,) comparatively small.

CHAPTER XII.

SUGAR CREEK; RAYMILTON; FRANKLIN; COCHRAN.

1044. *Well No.* 2.

May, 1871.

On middle branch of Sugar Creek, Jennings and Ralston farm, Jackson township, Venango county. Authority, J. B. Brown.

Well mouth above ocean in feet				
Drive pipe	48	to	48	=
Soapstone	64	"	112	=
Mountain granite freestone	28	"	140	=
Slate	72	"	212	=
1st SS. (First Sandstone) hard	28	"	240	=
Red rock	80	"	320	=
2d SS., A, pebble	3	"	323	=
Slate	8	"	331	=
2d SS., B	17	"	348	=
Slate	100	"	448	=
Red rock	100	"	548	=
Fire clay	23	"	571	=
3d SS., good	8	"	579	=
Mud vein	2	"	581	=
Shale pocket,	25	"	606	=

Cased at 335′.

Best production, 8 barrels per day. Dark green oil. Gravity, 44½°, now 43°.

This well is 480′ north of No. 3.

1045. *Well No.* 3.

1872.

On middle branch of Sugar Creek, Jennings and Ralston farm, Jackson township, Venango county. Authority, J. B. Brown, owner.

Well mouth above ocean in feet				
Drive pipe	95	to	95	=

?	205	to	300	=
2d SS	38	"	338	=
?	212	"	550	=
3d SS	19	"	569	=
? pocket,	14	"	583	=

Cased at 310′.

Best production, 2 barrels per day. No gas of any account.

Dark oil. Gravity, 42½°.

Abandoned this well after torpedoing and testing.

This well is 480′ south of No. 2.

1046. *Well No.* 2.

September, 1876.

Foster farm, Jackson township, Venango county. Authority, J. B. Brown, owner.

Well mouth above ocean in feet				
Conductor	23	to	23	=
?	197	"	220	=
Mountain granite freestone	20	"	240	=
? (Interval unknown)	200	"	440	=
1st SS. (First Sandstone)	24	"	464	=
?	108	"	572	=
2d SS	3	"	575	=
?	89	"	664	=
3d SS	15	"	679	=
? pocket,	9	"	688	=

Drilled dry. Cased at 240′.

Best production, 6 barrels per day.

Dark oil. Gravity, 43½°.

1047. *Mason Well, No.* 1.

Raymilton, Sandy Creek township, Venango county. Authority, Mr. Ritchie; from memory.

Well mouth above ocean in feet				
?	492	to	492	=
2d SS	38	"	530	=
? Some red rock	220	"	750	=
Stray 3d SS	20	"	770	=
Slate	12	"	782	=
3d SS	10	"	792	=

Wet hole. Production, 5 barrels per day of green oil.

In "Company Well, No. 2," near the above, the rocks were about the same, but only a small quantity of oil was obtained.

It was afterwards drilled to the depth of 1,000 feet. Nothing but slate and red rocks was found below the 3d sand. The red rocks lay in two bands, probably as much as 100 feet in thickness, both together.

1048. *Surprise Well, No.* 1.

1870.

J. Bleakley farm, Patchell Run, Sugar Creek township, Venango county, 2 miles N. N. E. of Franklin. Authority, John F. Carll.

Well mouth above ocean in feet				
? (Interval unknown)	95	to	95	=
Sandstone	31	"	126	=
?	19	"	145	=
Sandstone	5	"	150	=
?	27	"	177	=
Sandstone	10	"	187	=
?	18	"	205	=
Red rock	105	"	310	=
?	11	"	321	=
1st SS., (stopped in sand,)	16	"	337	=

Wet hole. Crevice with salt water and oil at 328′. Production at first, about 225 barrels per day. Averaged about 100 barrels per day during the first month. Always pumped considerable salt water with the oil. Color of oil black; gravity 32°.

1049. *M'Elhenny Well.*

September, 1875.

M'Elhenny farm, Oakland township, Venango county, on Two Mile Run, 5 miles above its junction with the Allegheny river. Authority, J. Johnson, driller.

Well mouth above ocean in feet				
?	164	to	164	=
Mountain SS	15	"	179	=
Red rock	110	"	289	=
?	29	"	318	=
1st SS., oil from lower part	55	"	373	=
Mud, slate, rock	127	"	500	=
2d SS., shelly	2	"	502	=
?	130	"	632	=
3d SS., shelly	8	"	640	=

1050. *Washington Well.*

1876.

On Wm. Murrin farm, Cranberry township, Venango county. Authority, C. E. Taft.

Well mouth above ocean in feet					+1176
? (Interval unknown)	328	to	328	=	+ 848
Red rock	115	"	443	=	+ 733
Slate	10	"	453	=	+ 723
1st SS. (First Sandstone)	47	"	500	=	+ 676
Slate	122	"	622	=	+ 554
2d SS	18	"	640	=	+ 536
Slate	100	"	740	=	+ 436
Red rock	15	"	755	=	+ 421
3d SS. (shells)	10	"	765	=	+ 411
Slate, with red rock and fossil shells	190	"	955	=	+ 221
SS., very hard	8	"	963	=	+ 213
Slate, with red rock and fossil shells	138	"	1101	=	+ 75
SS. flaggy, hard and close; blue, grey and white; oil and gas show	300	"	1401	=	− 225
Slate and shale, soft drilling, no decided red rock	105	"	1506	=	− 330

Drilled dry. Cased at 220′. But little gas. No oil. This well stopped drilling in "white slate."

1051. *Swan Well.*

Cochran farm, Cranberry township, Venango county; on the the Allegheny river. Authority, ——————.

Well mouth above ocean in feet				
?	175	to	175	=
Red rock	100	"	275	=
1st SS	40	"	315	=
?	117	"	432	=
2d SS	18	"	450	=

Second sand oil. Gravity, 34° to 35°.

CHAPTER XIII.

HORSE CREEK; SLATE RUN; SALINA; SALEM; ROCKLAND.

1052. *Folly Well.*

Situated in Cranberry township, Venango county, at the mouth of Horse Creek, on land owned by Mr. Lawsons and a New York company. Authority, ————————.

Well mouth above ocean in feet				
? (Interval unknown)	210	to	210	=
Rock (probably meaning sandstone)	10	"	220	=
?	64	"	284	=
Rock	28	"	312	=
?	29	"	341	=
Rock, upper part red	29	"	370	=
?	86	"	456	=

Gas at 214′ and 225′. Crevice at 292′ and 365′.

1053. *Collins Well, No.* 5.

On John Hoge farm, Slate Run, 3 miles south-east from Oil City. Drilled in 1872 to seventh sand, and deepened by Mr. Haskell in 1873. Authority, H. M. Haskell.

Well mouth above ocean in feet				
Conductor	47	to	47	=
?	43	"	90	=
1st SS. (First Sandstone)	30	"	120	=
?	50	"	170	=
2d SS	25	"	195	=
?	5	"	200	=
3d SS	25	"	225	=
?	145	"	370	=
4th SS	30	"	400	=
?	148	"	548	=
5th SS	8	"	556	=
?	29	"	585	=
6th SS	40	"	625	=

?	60	to	685	=
7th SS., the oil rock	33	"	718	=
Slate and shale	100	"	818	=

1054. *M'Bride Farm Well.*

Near Salem, Cranberry township, Venango county. Authority, M'Grew Bros., owners.

Well mouth above ocean in feet				
? (Interval unknown)	833	to	833	=
2d SS. (Second Sandstone)	20	"	853	=
?	89	"	942	=
SS., gray	40	"	982	=
Slate	23	"	1005	=

Cased at 246′.

1055. *M'Grew Well, No.* 1.

One mile west of Salem, Cranberry township, Venango Co., M'Grew farm. Authority, M'Grew Bros.

Well mouth above ocean in feet				
?	460	to	460	=
Mt. SS	50	"	510	=
?	135	"	645	=
1st SS	62	"	707	=
?	103	"	810	=
2d SS	22	"	832	=
?	78	"	910	=
Gray rock	40	"	950	=
3d SS	12	"	962	=

Cased at 327′.

1056. *M'Grew Well, No.* 2.

One mile west of Salem, Cranberry township, Venango Co., M'Grew farm. Authority, M'Grew Bros.

Well mouth above ocean in feet				
?	500	to	500	=
Mt. SS	50	"	550	=
?	172	"	722	=
1st SS	47	"	769	=
?	95	"	864	=
2d SS	24	"	888	=
?	126	"	1014	=
3d SS	23	"	1037	=

Cased at 360′.

1057. *Well No.* 12.

Craig farm, 1 mile west of Salem, Cranberry township, Venango county. Authority, M'Grew Bros., owners.

Well mouth above ocean in feet				
Conductor	10	to	10	=
? (Interval unknown)	649	"	659	=
1st SS. (First Sandstone)	45	"	704	=
?	100	"	804	=
2d SS	30	"	834	=
?	127	"	961	=
Shells, gray	20	"	981	=
Solid gray sandstone	40	"	1021	=
Shells and slate	79	"	1100	=
Slate, red	100	"	1200	=

Cased at 302′.

1058. *Brough Farm Well.*

One mile south of Salina, on Hall's run, Venango county. Authority, M'Grew Bros., owners.

Well mouth above ocean in feet				
Conductor	6	to	6	=
?	676	"	682	=
1st SS	82	"	764	=
?	51	"	815	=
2d SS	40	"	855	=
?	83	"	938	=
SS., gray	42	"	980	=
Slate	4	"	984	=
Pebble	3	"	987	=
Slate	33	"	1020	=

1059. *M'Grew Well.*

1875.

Goodrich farm, on Franklin and Clarion pike, near Hall's run, Cranberry township, Venango Co. Authority, D. M'Grew.

Well mouth above ocean in feet				
?	466	to	466	=
Mt. SS	34	"	500	=
Slate and red rock	125	"	625	=
Shells	42	"	667	=
1st SS	63	"	730	=
Slate	52	"	782	=
Red slate	25	"	807	=
2d SS	33	"	840	=

Slate and shells	75	to	915	=
Red slate	5	"	920	=
Gray SS	55	"	975	=
Slate	25	"	1000	=

Drilled dry. Cased at ——.

No paying production.

1060. *Gates Well, No.* 2.

At Rockland Station, on the Allegheny Valley railway, Venango Co. Authority, ——.

Well mouth above ocean in feet				
Drive pipe	32	to	32	=
? (Interval unknown)	100	"	132	=
SS. (Sandstone)	10	"	142	—
?	268	"	410	=
SS	17	"	427	=
?	274	"	701	=

Wet hole. Tested at 145′ and produced 12 barrels of 28° gravity oil. Tested again at 430′ and produced about 10 barrels per day for a short time. Drilled deeper, and abandoned at 701′.

CHAPTER XIV.

RENO; MILTON; FOSTERS; MOUNT HOPE; SCRUBGRASS.

Records of 5 wells on the farm of "Reno Oil Company," at Reno, Venango county, between Oil City and Franklin. Copied from the company's books.

1061. *Well No.* 7.

March 29, 1866.

Well mouth above ocean in feet, approximately					1020
Conductor	8	to	8	=	
Hard blue rock	46	"	54	=	
Sandy slate, hard	6	"	60	=	
SS., white and soft	18	"	78	=	
Sandy slate, hard and blue	9	"	87	=	
SS., white, coarse, hard	3	"	90	=	
Slate, blue, soft	92	"	182	=	
Red slate	103	"	285	=	
1st SS. (First Sandstone)	17	"	302	=	
Slate, blue and sandy	38	"	340	=	
Red slate	10	"	350	=	
Shale, blue and soft	50	"	400	=	
Shells, blue and hard	33	"	433	=	
2d SS., shelly, blue	18	"	451	=	
Soft blue rock and hard shells	217	"	668	=	
3d SS	12	"	680	=	
Soft, blue, tough rock	15	"	695	=	
Sandy slate and hard shells	17	"	712	=	
Red rock, sandy	28	"	740	=	
Sandy slate, blue	110	"	850	=	
Dark grey and soft blue rock	11	"	861	=	
Shells, hard	40	"	901	=	
Dark grey rock, soft	2	"	903	=	
Blue rock, soft	32	"	935	=	
Dark red rock, sandy	3	"	938	=	
Blue rock	2	"	940	=	
Red rock	11	"	951	=	
Blue rock	9	"	960	=	
Red rock	60	"	1020	=	

Slate, blue	5	to	1025	=
Brown rock, hard	5	"	1030	=
Blue rock, soft	2	"	1032	=
Brown and blue rock, hard	3	"	1035	=
Blue rock, soft	10	"	1045	=
Sand shells, blue and hard	3	"	1048	=
Blue rock, soft	2	"	1050	=
Bluish gray rock, hard	8	"	1058	=
Mud rock, soft	4	"	1062	=
Gray rock	5	"	1067	=
Blue rock, soft	8	"	1075	=
Blue rock, hard	15	"	1090	=

Wet hole. Cased at 200 feet with 3″ casing. Large water vein at 78′. Dry crevice of 18 inches at 288′. First oil show at 441′, and again at 1045′ and 1050′. Black soot at 293′, 708′ and 861′. Gas at 861′ and quite heavy at 1075′. Unproductive.

1062. *Reno Well, No.* 30.

Well mouth above ocean in feet					1016
Drive pipe	42	to	42	=	974
? (Interval unknown)	227	"	269	=	747
1st SS. (First Sandstone)	17	"	286	=	730
?	118	"	404	=	612
2d SS., show of oil	22	"	426	=	590
?	84	"	510	=	506
SS., gray	19	"	529	=	487
Slate	10	"	539	=	477
SS., white	31	"	570	=	446

Cased at 107′.

1063. *Reno Well, No.* 38.

Well mouth above ocean in feet				
Drive pipe	17	to	17	=
?	264	"	281	=
1st SS	21	"	302	=
?	124	"	426	=
2d SS	21	"	447	=
?	68	"	515	=
SS., gray	38	"	553	=
Slate	10	"	563	=
SS., white	14	"	577	=

Cased at 93′.

1064. *Reno Well, No.* 50.

Well mouth above ocean in feet					1011
Drive pipe	58	to	58	=	953
? (Interval unknown)	204	"	262	=	749
1st SS. (First Sandstone) ......estimated	20	"	282	=	729
?	119	"	401	=	610
2d SS	22	"	423	=	588
?	83	"	506	=	505
SS., gray	27	"	533	=	478
Slate	12	"	545	=	466
SS., white	21	"	566	=	445

Cased at 110′.

1065. *Reno Well, No.* 77.

Well mouth above ocean in feet					1029
Drive pipe	43	to	43	=	986
?	227	"	270	=	759
1st SS	40	"	310	=	719
?	105	"	415	=	614
2d SS	26	"	441	=	588
?	71	"	512	=	517
SS., gray	34	"	546	=	483
Slate	11	"	557	=	472
SS., white	20	"	577	=	452
SS., gray shells	88	"	665	=	364
Red rock and shells	125	"	790	=	239

Cased at 90′.

Records of Fisher, Hasson & Company's wells, on the Milton farm, Cranberry township, Venango county, 4 miles south-west of Oil City. Copied from the books of the company. All drilled dry and nearly all of them good producers.

1066. *Well No.* 2.

May 30, 1871.

Well mouth above ocean in feet					1345
?	605	to	605	=	740
1st SS	35	"	640	=	705
?	90	"	730	=	615
2d SS	28	"	758	=	587
?	133	"	891	=	454
3d SS	19	"	910	=	435

Cased at 383′.

1067. *Well No.* 3.

June 11, 1871.

Well mouth above ocean in feet					1358
? (Interval unknown)	610	to	610	=	748
1st SS. (First Sandstone)	40	"	650	=	708
?	110	"	760	=	598
2d SS	25	"	785	=	573
?	115	"	900	=	458
3d SS	21	"	921	=	437
? pocket,	35	"	956	=	402

Cased at 405′.

1068. *Well No.* 4.

August 9, 1871.

Well mouth above ocean in feet					1371
?	627	to	627	=	744
1st SS., estimated	40	"	667	=	704
?	108	"	775	=	596
2d SS., estimated	25	"	800	=	571
?	117	"	917	=	454
3d SS	20	"	937	=	434
? pocket,	10	"	947	=	424

Cased at 287′.

1069. *Well No.* 5.

August 23, 1871.

Well mouth above ocean in feet					1406
?	652	to	652	=	754
1st SS., estimated	40	"	692	=	714
?	260	"	952	=	454
3d SS	15	"	967	=	439
? pocket,	29	"	996	=	410

Cased at 297′.

1070. *Well No.* 9.

December 26, 1871.

Well mouth above ocean in feet					
?	690	to	690	=	
1st SS., estimated	40	"	730	=	
?	240	"	970	=	
3d SS	14	"	984	=	

Cased at 291′.

1071. *Well No.* 10.

March 27, 1872.

Well mouth above ocean in feet					1400
? (Interval unknown)	943	to	943	=	457
3d SS. (Third Sandstone)	19	"	962	=	438
? pocket,	30	"	992	=	408

Cased at 262′.

1072. *Well No.* 13.

January 10, 1873.

Well mouth above ocean in feet					
?	750	to	750	=	
1st SS., estimated	40	"	790	=	
?	60	"	850	=	
2d SS	30	"	880	=	
?	115	"	995	=	
3d SS	16	"	1011	=	
? pocket,	29	"	1040	=	

Cased at 302′.

1073. *Well No.* 14.

Well mouth above ocean in feet					
?	710	to	710	=	
1st SS	50	"	760	=	
?	95	"	855	=	
2d SS	28	"	883	=	
?	125	"	1008	=	
3d SS	12	"	1020	=	
? pocket,	30	"	1050	=	

Cased at 277′.

Well No. 6 struck 3d SS. at 964′; thickness not given. Depth of well, 1015′.

No. 11, 3d SS., 950′ to 962′. Depth, 994′..................1402

No. 12, 3d SS., 945′ to 962′. Depth, 999′..................1405

1074. *Well No.* 2—*on the "Three Leases."*

August 23, 1871.

Well mouth above ocean in feet					
?	730	"	730	=	
1st SS., estimated	40	"	770	=	
?	192	"	962	=	
3d SS	15	"	977	=	
? pocket,	11	"	988	=	

Cased at 268′.

Well No. 1 found 3d SS. from 957′ to 973′, 16 feet thick, and stopped at 976′.

Same company's well, No. 1, Bredin farm, shows 15′ of 3d SS., from 1060′ to 1075′.

Records of 8 wells owned by Lewis Bonsall & Co., situated at Foster, Rockland township, Venango county. Copied from company's books.

1075. *Well No.* 1.

Well mouth above ocean in feet					967
? (Interval unknown)	316	to	316	=	651
1st SS. (First Sandstone)	37	"	353	=	614
?	106	"	459	=	508
2d SS	30	"	489	=	478
?	121	"	610	=	357
3d SS	12	"	622	=	345

1076. *Well No.* 2.

Same record as No. 1, except the fact that in this well the sands were encountered at one foot less depth.

1077. *Well No.* 3.

Well mouth above ocean in feet					1022
?	370	to	370	=	652
1st SS	28	"	398	=	624
?	112	"	510	=	512
2d SS	28	"	538	=	484
?	124	"	662	=	360
3d SS	12	"	674	=	348

1078. *Well No.* 6.

Well mouth above ocean in feet					
?	400	to	400	=	
1st SS	20	"	420	=	
?	120	"	540	=	
2d SS	28	"	568	=	
?	126	"	694	=	
3d SS	14	"	708	=	

1079. *Well No.* 9.

Well mouth above ocean in feet					1084
? (Interval unknown)	417	to	417	=	667
1st SS. (First Sandstone)	20	"	437	=	647
?	130	"	567	=	517
2d SS	28	"	595	=	489
?	126	"	721	=	363
3d SS	15	"	736	=	348

1080. *Well No.* 12.

Well mouth above ocean in feet					
?	555	"	555	=	
1st SS	20	"	575	=	
?	130	"	705	=	
2d SS	28	"	733	=	
?	117	"	850	=	
3d SS	23	"	873	=	

1081. *Well No.* 14.

Well mouth above ocean in feet					1090
?	427	to	427	=	663
1st SS	20	"	447	=	643
?	125	"	572	=	518
2d SS	30	"	602	=	488
?	122	"	724	=	366
3d SS	21	"	745	=	345

1082. *Well No.* 17.

Well mouth above ocean in feet					
?	588	to	583	=	
1st SS	20	"	608	=	
?	130	"	738	=	
2d SS	28	"	766	=	
?	122	"	888	=	
3d SS	23	"	911	=	

These were all good wells, No. 6 being the largest producer.

[A red rock overlies the 1st SS. here, and a stray or gray rock comes in over the 3d SS. These are not noted in any of the records given.]

1083. *Eichiholtz Well, No.* 14.

Near Lewis Bonsall & Company's wells at Foster, Rockland township, Venango county. Authority, ———.

Well mouth above ocean in feet					967
? (Interval unknowu)	463	to	463	=	504
2d SS. (Second Sandstone)	30	"	493	=	474
?	105	"	598	=	369
3d SS	17	"	615	=	352

Well No. 75 found 3d SS. 27′ thick at 783′, and well No. 78 found it 21′ thick at 860′.

1084. *Well No.* 3.

Mt. Hope, Rockland township, Venango county, belonging to F. Prentice & Co. Authority, L. C. Blakeslee.

Well mouth above ocean in feet					1434
?	20	to	20	=	1414
Coal, position uncertain	2	"	22	=	1412
?	178	"	200	=	1234
SS., white	75	"	275	=	1159
?	395	"	670	=	764
Red rock	150	"	820	=	614
1st SS	40	"	860	=	574
Slate	90	"	950	=	484
2d SS., little salt water and oil	30	"	980	=	454
Slate	65	"	1045	=	389
Gray rock, stray SS	15	"	1060	=	374
Slate	15	"	1075	=	359
3d SS	19	"	1094	=	340

Cased at 275′.

Six other wells are given at Mt. Hope, Prentice & Co.'s, Nos. 9 and 15, and Buffalo Co.'s, Nos. 4, 5, 6 and 7, but as they are all made after the above formula, with precisely 130′ from top of 1st SS. to top of 2d SS., and 125′ from top of 2d SS. to top of 3d SS., it is unnecessary to insert them. The 3d SS. was found in these wells as follows: No 9 at 1070′; No. 15 at 1078′; No. 4 at 1068′; No. 5 at 1064′; No. 6 at 1067′ and No. 7 at 1063′.

1085. *Scrubgrass Island, Well No. —.*

1870. (?)

Near Scrubgrass, Rockland township, Venango county. Authority, W. K. Jacobs, Sup't.

Well mouth above ocean in feet, about					928
Drive pipe	30	to	30	=	
Slate	140	"	170	=	
Red rock	80	"	250	=	
Slate	20	"	270	=	
1st SS	80	"	350	=	
Slate	85	"	435	=	
Red rock	15	"	450	=	
2d SS	40	"	490	=	
Slate	50	"	540	=	
Red rock	15	"	555	=	
"Granite," stray 3d SS	20	"	575	=	
Slate	15	"	590	=	
3d SS	20	"	610	=	

The Island wells produced largely, and some of them are still pumping (1877).

1086. *Scrubgrass Well.*

Baum (Witherup) farm, Rockland township, Venango county, at mouth of Scrubgrass creek. Authority, Maj. W. T. Baum.

Well mouth above ocean in feet				
Drive pipe	46	to	46	=
? (Interval unknown)	248	"	294	=
1st SS. (First Sandstone)	73	"	367	=
?	88	"	455	=
2d SS	20	"	475	=
?	134	"	609	=
3d SS	14	"	623	=

1087. *Scrubgrass Well.*

Three-fourths of a mile below the mouth of Scrubgrass creek, Baum (Witherup) farm, Rockland township, Venango county. Authority, Maj. W. T. Baum.

Well mouth above ocean in feet				
Drive pipe	37	to	37	=
?	253	"	290	=
1st SS	60	"	350	=
?	92	"	442	=
2d SS	35	"	477	=
?	120	"	597	=
3d SS	20	"	617	=

1088. *New Well, Scrubgrass.*

Lower Baum tract, Rockland township, Venango county. Authority, Maj. W. T. Baum.

Well mouth above ocean in feet					943
Drive pipe	45	to	45	=	898
? (Interval unknown)	245	"	290	=	653
1st SS. (First Sandstone)	82	"	372	=	571
?	78	"	450	=	493
2d SS	49	"	499	=	444
?	108	"	607	=	336
3d SS	22	"	629	=	314

Salt water cased off at 519′. Best production, 20 barrels per day. Fair show of oil in first sand.

Records of four wells belonging to the Philadelphia and Boston Company, located on the M'Millan farm, near Scrubgrass, Rockland township, Venango county. Authority, Superintendent in charge.

1089. *Well No.* 15.

Well mouth above ocean in feet					1143
?	490	to	490	=	653
1st SS	75	"	565	=	578
?	85	"	650	=	493
2d SS	40	"	690	=	453
?	110	"	800	=	343
3d SS	24	"	824	=	319
Slate	16	"	840	=	303

1090. *Well No.* 17.

Well mouth above ocean in feet					1147
?	500	to	500	=	647
1st SS	75	"	575	=	572
?	85	"	660	=	487
2d SS	40	"	700	=	447
?	108	"	808	=	339
3d SS	30	"	838	=	309
Slate	9	"	847	=	300

1091. *Well No.* 47.

Well mouth above ocean in feet					1187
?	547	to	547	=	640
1st SS	70	"	617	=	570
?	83	"	700	=	487

2d SS	40	to	740	=	447
?	107	"	847	=	340
3d SS	19	"	866	=	321

1092. *Well No. 47B.*

Situated near Well No. 47, and towards Allegheny river.

Well mouth above ocean in feet				
? (Interval unknown)	290	to	290	=
Red rock	90	"	380	=
Slate	10	"	390	=
1st SS. (First Sandstone)	80	"	470	=
?	80	"	550	=
2d SS	40	"	590	=
?	75	"	665	=
"Granite," stray	10	"	675	=
Slate	25	"	700	=
3d SS	20	"	720	=

This record was given from memory.

CHAPTER XV.

BULLION RUN; CLINTONVILLE

1093. *Bullion Run Well.*

May, 1876.

Simcox farm, Clinton township, Venango county. Authority, Phillips Brothers.

Well mouth above ocean in feet				
Slate	10	to	10	=
Mountain SS.	100	"	110	=
Slate, with shells	190	"	300	=
SS., hard	20	"	320	=
Slate	75	"	395	=
Red rock	100	"	495	=
1st SS. (First Sandstone)	85	"	580	=
Slate, shelly	20	"	600	=
Red rock	45	"	645	=
2d SS., muddy	40	"	685	=
Slate	45	"	730	=
Red rock	10	"	740	=
Stray SS., (probably over-estimated)	40	"	780	=
Slate	15	"	795	=
3d SS	31	"	826	=
Slate	10	"	836	=

Drilled dry. Cased at ——. Best production, 5 barrels per day. Color of oil, dark green. The well flows through a ¾ inch pipe. This was the first productive well put down at Bullion Run.

1094. *Dean and Fertig Well.*

January 1, 1876.

Coulter farm, Clinton township, Venango county. Authority, I. E. Dean.

Well mouth above ocean in feet				
Conductor	13	to	13	=
Coal slate	57	"	70	=
SS., "fresh water sand"	90	"	160	=
Slate	9	"	169	=

SS., very white	125	to	294	=
Slate	31	“	325	=
SS., grey	7	“	332	=
Slate	278	“	610	=
Mountain SS., dark	135	“	745	=
Red rock	85	“	830	=
Slate	12	“	842	=
SS., close and grey	10	“	852	=
Slate	15	“	867	=
SS	8	“	875	=
Slate	13	“	888	=
SS	4	“	892	=
Slate	18	“	910	=
SS	15	“	925	=
Slate	50	“	975	=
Red rock	13	“	988	=
SS., pebbly, close, show of oil	36	“	1024	=
Slate	66	“	1090	=
SS., grey	25	“	1115	=
Slate	25	“	1140	=
SS. pebbly, no show of oil	4	“	1144	=
Slate	21	“	1165	=
Red rock	17	“	1182	=
Slate	26	“	1208	=
SS. grey, show of oil	10	“	1218	=
Slate	22	“	1240	=

Drilled dry. Cased at 307′.

No paying production. No gas. Green oil. Gravity, 38°.

1095. *Watson Well.*

1872.

C. M'Kee farm, Clinton township, Venango county. Authority, Wm. M'Kee.

Well mouth above ocean in feet				
Conductor	27	to	27	—
Slate	13	“	40	=
SS. (Sandstone) white	210	“	250	-
Slate	33	“	283	=
SS	10	“	293	=
Slate	274	“	567	=
SS	135	“	702	=
Red Rock	95	“	797	=
Slate	8	“	805	=
SS	40	“	845	=
Slate	15	“	860	=
SS	14	“	874	=
Slate	70	“	944	=
Red Rock	12	“	956	=
SS. pebbly, some oil	36	“	992	=

Slate	68	to	1060	=
Red Rock	5	"	1065	=
SS. gray granite	25	"	1090	=
Slate	16	"	1106	=
SS. white, pebbly and close, gas and oil	51	"	1157	=
Slate	9	"	1166	=

Drilled dry. Cased at 350′. Unproductive.

Gas sufficient to fire one boiler.

1096. *Dean Well.*

April 26, 1876.

Vanamon farm, Clinton township, Venango county. Authority, I. E. Dean.

Well mouth above ocean in feet				
Conductor	21	to	21	—
Slate	69	"	90	—
SS. (Sandstone) white, water sand	214	"	304	=
Slate	33	"	337	=
SS., gray	9	"	346	=
Slate	275	"	621	=
Mt. SS., gray	140	"	761	=
Red rock	90	"	851	=
Slate	8	"	859	=
Pebble (show of oil and gas)	40	"	899	=
Slate	15	"	914	=
SS	14	"	928	=
Slate	70	"	998	=
Red rock	12	"	1010	=
Pebble (show of oil)	36	"	1046	=
Slate	68	"	1114	=
SS., gray	8	"	1122	=
Slate	10	"	1132	—
SS., pebbly (show of black oil)	12	"	1144	=
Slate	13	"	1157	—
Pebble, close and hard	2	"	1159	=
Slate (good show of green oil)	25	"	1184	=
Red rock	20	"	1204	=
Slate	26	"	1230	=
SS., shells and gray sand	24	"	1254	=
Slate	12	"	1266	=

Drilled dry. Cased at 312′. Best production, 1½ barrels per day. Gas sufficient to fire 2 boilers. Green oil. Gravity, 48°.

CHAPTER XVI.

EMLENTON.

Records of 5 wells on the Russell farm, near Emlenton, Scrubgrass township, Venango county, belonging to Maj. W. T. Baum. Copied from his books.

1097. *Well No.* 1.

1870.

Well mouth above ocean in feet				
? (Interval unknown)	430	to	430	=
1st SS. (First Sandstone)	60	"	490	=
?	98	"	588	=
2d SS	32	"	620	=
?	40	"	660	=
"Granite," gas	5	"	665	=
?	35	"	700	=
SS	20	"	720	=

Best production, 1 barrel per day of amber oil from 1st SS. Gravity, 44°. Oil show at 705′.

1098. *Well No.* 2.

1870.

Well mouth above ocean in feet				
?	430	to	430	=
1st SS	80	"	510	=
?	98	"	608	=
2d SS	36	"	644	=
?	34	"	678	=
"Granite"	20	"	698	=
?	21	"	719	=
3d SS	21	"	740	=

Oil at 726′. 1 barrel per day. This well was within ten rods of No. 1.

1099. *Well No.* 3.

1870.

Well mouth above ocean in feet				
Conductor	38	to	38	=
? (Interval unknown)	377	"	415	=
1st SS. (First Sandstone)	80	"	495	=
?	95	"	590	=
2d SS.	30	"	620	=
?	40	"	660	=
Stray SS., estimated	20	"	680	=
?	29	"	709	=
3d SS	18	"	727	=
? (soft, no more sandstone or oil)	373	"	1100	=

Oil at 665′. Pumped 6 months*and then deepened. Oil at 718′. This well is 150 rods from No. 1, and down the river.

1100. *Well No.* 4.

1870.

Twenty rods below Russell run.

Well mouth above ocean in feet				
Conductor	46	to	46	=
?	355	"	401	=
1st SS	60	"	461	=
?	145	"	606	=
2d SS	30	"	636	=
?	37	"	673	=
Boulder	19	"	692	=
?	21	"	713	=
3d SS	18	"	731	=

Amber oil at 718′.

1101. *Well No.* 5.

1870.

Twenty rods above Russell run.

Well mouth above ocean in feet				
Conductor	33	to	33	=
?	388	"	421	=
1st SS	69	"	490	=
?	125	"	615	=
SS	30	"	645	=
?	37	"	682	=
Boulder	16	"	698	=
?	17	"	715	=
3d SS. (gas and amber oil)	24	"	739	=

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*At 680′.

1102. *Young, No.* 8.

Emlenton, Russell farm, Richland township, Venango county Authority, Mr. Young.

Well mouth above ocean in feet (approximately)			885	
Drive pipe	47	to	47	=
? (Interval unknown)	263	"	310	=
Red rock	80	"	390	=
Slate	20	"	410	=
1st SS. (First Sandstone)	80	"	490	=
? (three bands of red rock here)	102	"	592	=
2d SS. (oil rock)	45	"	637	=
?	26	"	663	=
"Granite" or boulder (oil)	20	"	683	=
?	17	"	700	=
3d SS	34	"	734	=
?	16	"	750	=
Extra stray SS. (3d)	15	"	765	=
? (10′ of red) pocket,	43	"	808	=

This well was a moderate pumper, the oil coming from th 2d SS. and boulder.

1103. *Emma Well.*

Emlenton, Richland township, Venango county, near th bridge. Authority, Mr. Perry.

Well mouth above ocean in feet				
?	31	to	31	=
SS	40(?)	"	71	=
?	411	"	482	=
Shells of sand	50	"	532	=
?	94	"	626	=
SS., gray	6	"	632	=
SS., red	8	"	640	=
SS., pebble (good show of oil)	27	"	667	=
?	33	"	700	=
Boulder	18(?)	"	718	=
?	42	"	760	=
3d SS	26	"	786	=

Cased at 518′. Mud seam and gas at 709′.

1104. *Crawford & Company's Well.*

Near Emlenton, Richland township, Venango county. Au thority, ——.

Well mouth above ocean in feet				
?	700	to	700	=
2d SS. (?)	60(?)	"	760	=

?	28	to 788	=
Stray SS. (?)	20(?)	" 808	=
?	140	" 948	=
3d SS	22	" 970	=

1105. *Florence Well.*

Near Emlenton, Richland township, Venango county. Authority, Capt. Schmock.

Well mouth above ocean in feet			
? (Interval unknown)	420	to 420	=
1st SS. (First Sandstone)	70(?)	" 490	=
?	121	" 611	=
2d SS	54	" 665	=
?	20	" 685	=
Boulder and pebble	20	" 705	=

There is a mountain sand above the 1st.

CHAPTER XVII.

CLARION COUNTY.

1106. *M'Grew Bros. Well.*

1876.

E. Ritts farm, between Petersburg and Emlenton, Richland township, Clarion county. Authority, D. M'Grew.

Well mouth above ocean in feet				
? (Interval unknown)	[illegible]	to	[illegible]	=
1st SS. (First Sandstone)	80	"	[illegible]	=
?	[illegible]	"	1070	=
2d SS	10	"	1080	=
?	94	"	1174	=
Grey rock	10	"	1184	=
Slate, free from grit	20	"	1204	=
3d SS	6	"	1210	=
Slate, soft, estimated	410	"	1620	=
Red rock	40	"	1660	=
Slate, shelly	20	"	1680	=
Slate, soft	20	"	1700	=

Two feet of 3d SS., top, grey, 4′ of 3d SS., bottom, good coarse pebbles. Unproductive.

1107. *Well No.* 1.

Keating farm, near Richmond, 1 mile east of St. Petersburg, Richland township, Clarion county. Authority, M Grew Bros., owners.

Well mouth above ocean in feet				
?	230	to	230	=
Mt. SS	90	"	320	=
?	412	"	732	=
1st SS	113	"	845	=
?	35	"	880	=
2d SS	12	"	892	=
?	98	"	990	=
Boulder	18	"	1008	=
Slate, black	20	"	1028	=
3d SS	12	"	1040	=

Cased at 382′. Best production, 80 barrels per day. Not drilled through the sand.

1108. *Baldcy Well.*

Masters' farm, Richland township, Clarion county. Authority, ———.

Well mouth above ocean in feet					1334
? (Interval unknown)	825	to	825	=	509
1st SS. (First Sandstone)	25	"	850	=	484
?	50	"	900	=	434
2d SS	40	"	940	=	394
?	80	"	1020	=	314
Red Rock	10	"	1030	=	304
?	30	"	1060	=	274
Boulder	9	"	1069	=	265
?	36	"	1105	=	229
3d SS., not through	35	"	1140	=	194

Drilled dry.

1109. *Mingo Chief.*

———.

On Masters' farm, near Turkey City, Clarion county. Authority, ———.

Well mouth above ocean in feet					1339
?	300	to	300	=	1039
M. SS.(including "40' rock"	100	"	400	=	939
?	400	"	800	=	539
1st SS	70	"	870	—	469
?	80	"	950	=	389
2d SS. (estimated)	20	"	970	=	369
? with red rock	140	"	1110	=	229
3d SS	40	"	1150	=	189

1110. *Gilbert Well, No.* 2.

November, 1875.

Hummell farm, Salem township, Clarion county. Authority, R. V. Gilbert.

Well mouth above ocean in feet					1451 ?
?	70	to	70	=	
Bluff SS	15	"	85	=	
?	210	"	295	=	
Mt. SS.	110	"	405	=	
Slate	40	"	445	=	
SS. "salt water sand"	100	"	545	=	
Slate and shells	410	"	955	=	
1st SS	80	"	1035	=	
?	20	"	1055	=	
2d SS	20	"	1075	=	

Slate	10	to	1085	=	
Red rock	40	"	1125	=	
?	60	"	1185	=	
Boulder, show of oil	15	"	1200	=	

Drilled dry. Cased at ——′. This well was still drilling when the record was taken (Nov. 5, 1875).

1111. *Sherman Well.*

Widow Krebbs farm, Beaver township, Clarion county. Authority, ———.

Well mouth above ocean in feet					1404
? (Interval unknown)	25	to	25	=	1379
Coal	2	"	27	=	1377
?	48	"	75	=	1329
Coal	3	"	78	=	1326
?	122	"	200	=	1204
Mt. SS. (Mountain Sandstone)	160	"	360	=	1044
?	100	"	460	=	944
Salt water SS	40	"	500	=	904
?	353	"	853	=	551
1st SS	35	"	888	=	516
Slate	25	"	913	=	491
SS	20	"	933	=	471
? including red rock	117	"	1050	=	354
2d SS	15	"	1065	=	339
Slate	15	"	1080	=	324
Red rock	40	"	1120	=	284
?	8	"	1128	=	276
Boulder	10	"	1138	=	266
?	15	"	1153	=	251
3d SS., not through	21	"	1174	=	230

Drilled dry. Cased at ——′.

1112. *Keily Brothers Well.*

Sam. Beals farm, Beaver township, Clarion county. Authority, Mr. Keily.

Well mouth above ocean in feet					1433
?	90	to	90	=	1343
Mt. SS	209	"	299	=	1134
?	602	"	901	=	532
1st SS. A	25	"	926	=	507
Slate	25	"	951	=	482
1st SS. B	25	"	976	=	457
Shale, salt water	42	"	1018	=	415
Slate	2	"	1020	=	413
2d SS	40	"	1060	=	373

?	60	to	1120	=	313
Red rock	40	"	1160	=	273
Boulder	10	"	1170	=	263
Slate	11	"	1181	=	252
3d SS., not through	19	"	1200	=	233

Drilled dry. Cased at ——′. Crevice at 208′.

1113. *Keiley Brothers Well.*

Cropp farm, Salem township. Authority, Keiley Brothers.

Well mouth above ocean in feet					1403
? (Interval unknown)	85	to	85	=	1318
Coal	7 ?	"	92	=	1311
Slate	28	"	120	=	1283
Mt. SS. (including 40 foot rock)	220	"	340	=	1063
?	560	"	900	=	503
1st SS. (First Sandstone)	50	"	950	=	453
?	70	"	1020	=	383
2d SS	40	"	1060	=	343
?	43	"	1103	=	300
Red rock	40	"	1143	=	260
SS. (boulder)	15	"	1158	=	245
Slate	5	"	1163	=	240
3d SS	30	"	1193	=	210
? pocket,	5	"	1198	=	205

1114. *Well No.* 1.

M'Ilhattan farm, one mile south-east of Edenburg, Clarion county. Authority, M'Grew Bros., owners.

Well mouth above ocean in feet				
?	695	to	695	=
1st SS	30	"	725	=
?	301	"	1026	=
3d SS	20	"	1046	=

Cased at 469′.

1115. *Well No.* 2.

Moon farm, Edenburg, Beaver township, Clarion county. Authority, M'Grew Bros., owners.

Well mouth above ocean in feet				
?	700	to	700	=
1st SS	30	"	730	=
?	242	"	972	=
3d SS	29	"	1001	=

Cased at 442′.

1116. *Oelschlager Well, No.* 1.

1873.

Oelschlager farm, Ashland township, Clarion county. Authority, W. J. Brundred.

Well mouth above ocean in feet				
? (Interval unknown)	**285**	**to**	**285**	=
Mt. SS. (Mountain Sandstone)	**125**	"	**410**	=
Slate, shelly	**215**	"	**625**	=
Slate	**125**	"	**750**	=
1st SS	**45**	"	**795**	=
Slate, shelly	**40**	"	**835**	=
2d SS	**20**	"	**855**	=
Shale, gray	**35**	"	**890**	=
Red rock	**40**	"	**930**	=
Slate, shelly	**40**	"	**970**	=
SS., gray	**15**	"	**985**	=
Slate	**7**	"	**992**	=
3d SS	**21**	"	**1013**	=
Slate	**1**	"	**1014**	=
SS., dark	**8**	"	**1022**	=
Slate, shelly	**8**	"	**1030**	=
SS., hard white pebble, oil	**4**	"	**1034**	=
Slate, dark	**5**	"	**1039**	=
SS., shells	**3**	"	**1042**	=
Slate, shelly	**13**	"	**1055**	=
Shale	**10**	"	**1065**	=
Slate, black	**55**	"	**1120**	=
Red rock	**8**	"	**1128**	=

Drilled dry. Cased at ——. Unproductive. Gas at 780′. Pebble and oil show from 998′ to 1013′.

1117. *Hope Well.*

June 29, 1876.

Camp Ridge farm, Elk township, Clarion county, owned by Hess, Bradley & Co. Authority, M. E. Hess.

Well mouth above ocean in feet					1324
Conductor, clay and sandy loam	10	to	10	=	1314
SS	54	"	64	=	1260
Slate, gray	7	"	71	=	1253
SS., brown	8	"	79	=	1245
SS., white	51	"	130	=	1194
Slate, dark	42	"	172	=	1152
SS., white	27	"	199	=	1125
Slate, black	18	"	217	=	1107
SS., greenish	8	"	225	=	1099
Slate gray	5	"	230	=	1094
SS., dark	94	"	324	=	1000

Slate, very dark	70	to	394	=	930
Shale, gray	25	"	419	=	905
Slate, gray	90	"	509	=	815
Shale, dark	30	"	539	=	785
Slate, whitish cast	110	"	649	=	675
Shale, dark	50	"	699	=	625
1st SS., dark	45	"	744	=	580
SS., black	10	"	754	=	570
Red rock	10	"	764	=	560
Slate, black	13	"	777	=	547
SS., light	22	"	799	=	525
Slate, reddish	16	"	815	=	509
SS., gray	31	"	846	=	478
Slate, dark	6	"	852	=	472
Red rock, dark red	45	"	897	=	427
Slate, light	12	"	909	=	415
SS., greenish	12	"	921	=	403
Slate, dark	11	"	932	=	392
SS., white	3	"	935	=	389
Slate, light	4	"	939	=	385
3d SS., dark	3	"	942	=	382
Pebble and sand, some oil	13	"	955	=	369
SS	22	"	977	=	347

Drilled dry. Cased at 333′. Best production, 5 barrels per day. Half enough gas to fire one boiler. Green oil.

1118. *Lineman Farm Well.*

Elk township, Clarion county. From driller's memory.

Well mouth above ocean in feet				
? (Interval unknown)	990	to	990	=
Edenburg oil SS. (Sandstone)	20	"	1010	=
Slate	30	"	1040	=
SS., hard, fine and black	15	"	1055	=
SS., red	20	"	1075	=
Slate blue, and shells	175	"	1250	=
Slate, red	90	"	1340	=
Slate, blue	10	"	1350	=
1st SS. of Oil creek, gray	10	"	1360	=
Slate, black	70	"	1430	=
Slate red	10	"	1440	=
2d SS., Oil creek	10	"	1450	=

Tools stuck, and well abandoned.

This record, it will be noticed, comes from one entertaining the erroneous idea that the Southern equivalents of the Oil Creek sands lie several hundred feet below the Edenburg oil rock. With full faith in this theory he drilled on below the regular oil horizon of the Edenburg district, and the record gives us an insight into the measures below, for a distance of 440 feet.

1119. *Shippenville Furnace Well.*

1865. (?)

Jacob Black farm, Elk township, Clarion county. Authority, Jacob Black, Jr.

Well mouth above ocean in feet				
Conductor	26	to	26	=
SS. (Sandstone) white	16	"	42	=
Mud rock, yellow	3	"	45	=
SS., blue, close	11	"	56	=
Slate	3	"	59	=
SS., blue, coarse	65	"	124	=
Slate, water crevice	4	"	128	=
SS., blue	24	"	152	=
Slate, shelly	320	"	472	=
SS	22	"	494	=
Slate, hard	30	"	524	=
SS., shelly	3	"	527	=
Slate	2	"	529	=
SS	5	"	534	=
Red rock	2	"	536	=
Slate, hard	10	"	546	=
SS., blue, 5′ top fine, 10′ bottom coarse	15	"	561	=
Slate, shelly, very hard	139	"	700	=
SS., gray	15	"	715	=
Red rock, red sand	15	"	730	=
SS., gray	5	"	735	=
Red rock	20	"	755	=
Slate, shelly	10	"	765	=
Red rock	45	"	810	=
Slate, shelly, hard	62	"	872	=
SS	20	"	892	=
Slate	15	"	907	=
SS	42	"	949	=
Slate	16	"	965	=
SS., white	3	"	968	=
Slate, open	16	"	984	=
SS., white	3	"	987	=
Slate, soft	10	"	997	=
Red rock	5	"	1002	=

Wet hole. Cased at ——′. Unproductive.

1120. *Abram James Well.*

Drilled 1872-3-4.

On Blyson run, Mill Creek township, Clarion county. Authority, Abram James.

Well mouth above ocean in feet				
Conductor	25	to	25	=

SS. (Sandstone) rotten; no limestone	253	to	278	=
Mt. SS., white and gray (gas at 380′)	157	"	435	=
SS., gray (oil at 445′ and 518′)	90	"	525	=
Slate, blue	135	"	660	=
SS., gray	28	"	688	=
Slate	30	"	718	=
SS., gray	12	"	730	=
Slate, with shells of gray sandstone	120	"	850	=
Red rock (gas near bottom)	45	"	895	=
Slate, black, hard and gritty	5	"	900	=
SS., "boulder," gray and gritty	30	"	930	=
SS., "emery," fine and hard	5	"	935	=
Slate, black	11	"	946	=
Red rock	5	"	951	=
Slate, blue, with shells	62	"	1013	=
Red rock	7	"	1020	=
Slate, black, with gray shells; first salt water	92	"	1112	=
Shale, black and red; green SS. near bottom	13	"	1125	=
Red SS	4	"	1129	=
SS., gray (gas and oil show)	13	"	1142	=
SS., pebbly, dark gray	11	"	1153	=
Slate, with small "mustard seed" pebbles	6	"	1159	=
SS., fine and light	17	"	1176	=
Slate, black, with white shells of sand	29	"	1205	=
Slate, blue and soft	18	"	1223	=
SS., light gray and fine	33	"	1256	=
Red SS., very red	20	"	1276	=
Soapstone	167	"	1443	=
Slate, dark and gritty (gas)	20	"	1463	=
Slate, light	5	"	1468	=
Slate, blue, with transparent pebbles	10	"	1478	=
SS., gray and light gray	21	"	1499	=
Slate, dark	17	"	1516	=
SS., light gray, hard	27	"	1543	=
SS., white (gas and oil show)	2	"	1545	=
Slate, light blue	17	"	1562	=
SS., fine, dark gray (gas)	8	"	1570	=
Shells of sandstone	5	"	1575	=
SS., gray, coarser near bottom (gas)	30	"	1605	=
Red rock, sand, fawn-colored, like paint (gas and oil show)	23	"	1628	=
Soapstone, light and soft	13	"	1641	=
SS., gray and white, with shells and slate	45	"	1686	=
Slate, clear white, no grit	27	"	1713	=
Red rock, hematite, very red	6	"	1719	=
SS., "boulder," fine	15	"	1734	=
Soapstone	14	"	1748	=
SS., nearly white (gas and oil)	22	"	1770	=
Slate, blue, "buckwheat batter"	60	"	1830	=
SS., white	2	"	1832	=
Slate, gritty	6	"	1838	=
SS., sharp and white	4	"	1842	=

Slate, white	3	to	1845	—
SS. (Sandstone).......gas	6	"	1851	=
Slate, white	28	"	1879	—
SS., hard	2	"	1881	=
SS., coarser at bottom (gas and oil)	23	"	1904	=
Shelly slate	44	"	1948	=
Slate, bluo, free from grit	49	"	1997	=
Shelly slate	43	"	2040	=
SS., fine (gas)	13	"	2053	=
Shalo, olive, free from grit	10	"	2063	=
Shale, olive, with brown shells (gas and oil)	49	"	2112	=
Slate, light blue	20	"	2132	=
Soapstone, light brown	20	"	2152	=
SS., white (large increase of gas)	3	"	2155	=
Shelly slate	7	"	2162	=
Slate, blue and free from grit	71	"	2233	=
SS., "boulder," very hard	3	"	2236	=
Shelly, very gassy slate	25	"	2261	-
Slate, light and soft, not gritty	10	"	2271	=
SS., not through	52	"	2323	=

Cased at 314′, but salt water came in below the casing and stood all the time within 1,000′ of the top, so that the well was virtually a "wet hole."

"We are now in a 'boulder' to the depth of 52′ with reamer stuck. All through this rock so far we got much gas, and I am strongly of the opinion that a heavy oil producing rock lies immediately under this."

Partially tested at 1,200′, but not afterwards. Unproductive.

1121. *Sligo Well.*

August, 1865.

Licking creek, Piney township, Clarion county. Authority, Lyon, Shorb & Co.

Well mouth above ocean in feet				
Conductor	15	to	15	—
Slate (soft and light 22′, black 5′)	27	"	42	=
SS., hard	7	"	49	=
Slate, soft and black	6	"	55	=
SS., hard	7	"	62	=
Slate, shelly	3	"	65	=
Coal	2	"	67	=
SS. (water at 128′)	116	"	183	=
Slate, top hard, bottom soft	85	"	268	=
Red rock, soft slate	2	"	270	=
SS., soft	10	"	280	=
Slate	90	"	370	=

SS., close-grained and blue	20	to	390	=
Slate	49	"	439	=
SS., hard and blue	27	"	466	=
Slate, soft, "resembling fire-clay"	284	"	750	=
Red rock, soft slate	5	"	755	=
SS., hard	10	"	765	=
Slate, blue	21	"	786	=
Red rock (slate)	29	"	815	=
Slate, blue	77	"	892	=
Red rock (slate)	3	"	895	=
Slate, brown	30	"	925	=
Slate, hard and soft alternating (oil)	112	"	1037	=
Slate, blue and shelly	14	"	1051	=
SS., blue	30	"	1081	=
SS., blue and red	36	"	1117	=
SS., white and hard	11	"	1128	=
SS., red and white	13	"	1141	=
SS., blue and red	10	"	1151	=

No paying production.

Salt water at 128′, 380′ and 450′.

Well mouth 173′ below the ore bed.

Elevation of top of conductor pipe above tide water at Philadelphia, 1,130′. The Sligo Branch RR. base makes it 1,088′.

[How these varying elevations were obtained we do not know. Our adjustment of RR. levels raises the Low Grade or Bennett's Branch railway 26′, and no doubt carries up the Sligo Branch also; then 1088+26=1114 as the level of the well mouth above ocean, as against 1130+7=1137 by the Philadelphia tide water datum.]

1122. *Madison Well, No.* 1.

January, 1867.

Brush run, south of Clarion river, Clarion county. Authority, Lyon, Shorb & Co.

Well mouth above ocean in feet				
Conductor	7	to	7	=
SS. (Sandstone)	13	"	20	=
Slate, soft	107	"	127	=
Slate, red and hard	33	"	160	=
SS., hard	49	"	209	=
Slate and shells	81	"	290	=
Slate, blue	250	"	540	=
SS., white and hard	12	"	552	=
Slate	44	"	596	=

SS., white (gas throwing water 80' high)	40	to	636	=
SS. (Sandstone) red	58	"	694	=
SS., white	75	"	769	=
Slate	35	"	804	=
SS., white	32	"	836	=
Slate	198	"	1034	=
SS., hard, close and white	28	"	1062	=
Slate (salt water and gas)	261	"	1323	=
SS. and shells	63	"	1386	=
SS., white	78	"	1464	=
SS., blue, with hard shells	124	"	1588	=
Hard pan	23	"	1611	=
Granite, white (harder than steel!)	25	"	1636	=

Wet hole. Oil shows while drilling, but unproductive.

Tools stuck at 1,636′ and well abandoned. The gas has been discharging copiously ever since. This well is about 3 miles from Madison, No. 2.

1123. *Madison Well, No.* 2.

January 19, 1865.

Brush run, south of Clarion river, Clarion county. Authority, Lyon, Shorb & Co.

Well mouth above ocean in feet				
Conductor	13	to	13	=
SS., white	81	"	94	=
SS., blue	85	"	179	=
Slate, soft	58	"	237	=
SS., gray (flow of fresh water)	38	"	275	=
SS., blue	98	"	373	=
Slate	145	"	518	=
1st SS., gray (gas)	20	"	538	—
Slate, blue	112	"	650	=
SS., hard	123	"	773	=
Slate, red, shelly (gas)	68	"	841	=
SS., blue and hard	174	"	1015	—
3d SS., small pebbles	32	"	1047	—

Wet hole. Several good oil shows while drilling, but unproductive. This well is about 3 miles from Madison Well, No. 1.

CHAPTER XVIII.

FOXBURG TO PETROLIA.

1124. *Cliff Well.*

About 1870.

Anchor farm, in Wild Cat or Dark Hollow, west of Allegheny river, at Foxburg, Perry township, Armstrong county. Authority, J. W. Ramsey.

Well mouth above ocean in feet				
Drive pipe	21	to	21	=
? (Interval unknown)	153	"	174	=
Mt. SS. (Mountain Sandstone)	21	"	195	=
?	285	"	480	=
1st SS., estimated	20	"	500	=
?	15	"	515	=
Red rock, estimated	40	"	555	=
?	27	"	582	=
SS., hard blue, estimated	10	"	592	=
?	13	"	605	=
Red rock, estimated	10	"	615	=
?	20	"	635	=
Stray SS., estimated	15	"	650	=
?	10	"	660	=
2d SS	20	"	680	=
?	35	"	715	=
Red rock, estimated	10	"	725	=
SS., hard, estimated	10	"	735	=
Boulder estimated	20	"	755	=
?	30	"	785	=
3d SS., about	20	"	805	=

Best production, 5 barrels per day.

1125. *Bryan Well.*

1870.

Fowler farm, Foxburg, near the Allegheny river. Authority, J. W. Ramsey.

Well mouth above ocean in feet				
?	85	to	85	=
Mountain SS.	30	"	115	=

	390	to	505	=
1st SS	35	"	540	=
?	135	"	675	=
2d SS	55	"	730	=
?	15	"	745	=
Boulder	20	"	765	=
?	30	"	795	=
3d SS	21	"	816	=

Best production, 25 barrels.

1126. *Lambing Well.*

Fox farm, near Foxburg, Clarion county. Authority, Stephen Harley.

Well mouth above ocean in feet				
? (Interval unknown)	610	to	610	=
1st SS. (First Sandstone)	40	"	650	=
?	150	"	800	=
2d SS	20	"	820	=
?	94	"	914	=
3d SS	30	"	944	=

Two streaks of slate occur in the 3d SS., one at 929′, the other at 931.′ The well is said to be 150′ above the Allegheny river

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Records of 4 wells on the Columbia Oil Company's "Reddick farm," situated in Allegheny township, Butler county, two miles north 20° west of Parker City. Authority, N. L. Moore, Superintendent.

1127. *Well No.* 1.

1871.

Well mouth above ocean in feet				
Conductor	20	to	20	=
?	1220	"	1240	=
3d SS	27	"	1267	=

Drilled dry. Cased at 416′. Production, 8 barrels.

1128. *Well No.* 2.

1872.

Well mouth above ocean in feet					1479
Conductor	11	to	11	=	1468
? (Interval unknown)	1369	"	1380	=	99
3d SS. (Third Sandstone)	18	"	1398	=	81

Drilled dry. Cased at 485′. Average production, 11 barrels.

1129. *Well No.* 3.

August 30, 1873.

Well mouth above ocean in feet					1490
Conductor	8	to	8	=	1482
?	1092	"	1100	=	390
1st SS	50	"	1150	=	340
?	60	"	1210	=	280
2d SS	40	"	1250	=	240
?	138	"	1388	=	102
3d SS	18	"	1406	=	84
?	2	"	1408	=	82

Drilled dry. Cased at 505′. Gas sufficient to fire 3 boilers. Best oil indications at 1,396′. Best production, 40 barrels per day. Average to August, 1876, 17 barrels per day.

1130. *Well No.* 4.

January 10, 1876.

Well mouth above ocean in feet					
Conductor, clay	18	to	18	=	
Slate, black	70	"	88	=	
Limestone, black......**Limestone**	10	"	98	=	
Soapstone	57	"	155	=	
SS., 60′ rock	60	"	215	=	
Slate, hard shells, gray	60	"	275	=	
SS., fine grained, hard and gray	10	"	285	=	
Slate, black	20	"	305	=	
Slate, shelly	45	"	350	=	
Mountain SS	100	"	450	=	
Slate, with gray shells	300	"	750	=	
SS., gray, hard	20	"	770	=	
Slate	120	"	890	=	
Slate, white	55	"	945	=	
1st SS., with some gas	60	"	1005	=	
Red rock	35	"	1040	=	
2d SS., oil show	40	"	1080	=	
Slate	2	"	1082	=	

SS		35	to	1117	=
Soapstone		23	"	1140	=
SS		28	"	1168	=
Soapstone		30	"	1198	=
SS		8	"	1206	=
Soapstone		2	"	1208	=
SS		12	"	1220	=
Soapstone		30	"	1250	=
3d SS		27	"	1277	=
Slate	pocket,	3	"	1280	=

Drilled dry. Cased at 291′. Gas sufficient to fire 5 boilers. Best oil indications at 1,259′. Best production, 15 barrels per day. Average to August, 1876, 3½ barrels per day. Green oil.

1131. *Critchlow Well.*

On Dutchess farm, Allegheny township, Butler county. Authority, ———.

Well mouth above ocean in feet					1097
? (Interval unknown)	300	to	300	=	797
Mountain SS. (Mountain Sandstone)	20	"	320	=	777
?	420	"	740	=	357
1st SS., very hard	20	"	760	=	337
?	220	"	980	=	117
2d SS., thickness about	20	"	1000	=	97
?	10	"	1010	=	87
?	15	"	1025	=	72
Stray SS	13	"	1038	=	59
Slate	2	"	1040	=	57
3d SS., 15′ in sand	15	"	1055	=	42

Drilled dry. Cased at 450.′ Oil show in 2d sand.

1132. *Elk Well.*

On Robinson farm, Perry township, Armstrong county. Authority, Stephen Harley.

Well mouth above ocean in feet				?
?	730	to	730	=
1st SS	45	"	775	=
?	65	"	840	=
2d SS	20	"	860	=
?	60	"	920	=
3d SS	30	"	950	=

1133 *Kittanning Well.*

May, 1869.

W. D. Robinson farm, Perry township, Armstrong county. Authority, Thomas M'Connell.

Well mouth above ocean in feet				
? (Interval unknown)	205	to	205	=
1st SS. (First Sandstone)	45	"	250	=
?	270	"	520	=
2d SS., gas	28	"	548	=
?	22	"	570	=
SS., sand and shells	30	"	600	=
?	170	"	770	=
SS., boulder 20' very hard, 9' soft	29	"	799	=
?	16	"	815	=
3d SS	29	"	844	=

Best production, 20 barrels per day. Gas very strong in 2d SS. Oil in slate at 467'. Show of oil at 475'. Best show of oil at 585'.

1134. *Packer Well.*

June, 1869.

W. D. Robinson farm, Perry township, Armstrong county, opposite mouth of Clarion river. Authority, Thos. M'Connell.

Well mouth above ocean in feet				
?	490	to	490	=
1st SS., estimated	40	"	530	=
?	80	"	610	=
2d SS	30	"	640	=
?	137	"	777	=
3d SS	35	"	812	=

1135. *Perry Well.*

W. D. Robinson farm, Perry township, Armstrong county. Authority, Thomas M'Connell.

Well mouth above ocean in feet				
?	487	to	487	=
1st SS	22	"	509	=
?	165	"	674	=
2d SS	38	"	712	=
?	24	"	736	=
Boulder, very hard	18	"	754	=
?	18	"	772	=
3d SS	29	"	801	=

1136. *Sheasley Well.*

1869 or 1870.

Parker City, near west end of bridge, Armstrong county. Authority, J. W. Ramsey.

Well mouth above ocean in feet, about					+ 875
Drive pipe	51	to	51	=	
Slate	152	"	203	=	
Mt. SS. (Mountain Sandstone)	21	"	224	=	
Slate	301	"	525	=	
1st SS.	30	"	555	=	
Slate	15	"	570	=	
Stray SS	20	"	590	=	
Slate	35	"	625	=	
2d SS	25	"	650	=	
Slate	15	"	665	=	
SS., hard blue	15	"	680	=	
Slate	60	"	740	=	
Boulder	20	"	760	=	
Slate	60	"	820	=	
3d SS no pocket,	30	"	850	=	

Best production, 30 barrels per day.

1137. *Armstead Well, No.* 1.

At Farrentown, Perry township, Armstrong county. Authority, John Morrison.

Well mouth above ocean in feet						1140
?		160	to	160	=	980
COAL		4	"	164	=	976
?		36	"	200	=	940
SS		100	"	300	=	840
?		160	"	460	=	680
SS., cased 475′		20	"	480	=	660
? Red shells near bottom		320	"	800	=	340
2d SS		20	"	820	=	320
White slate	?	298	"	1118	=	22
Shelly sand	?					
Red rock	40′					
Shelly sand	?					
Blue Monday	4′					
Soft shells	?					
Boulder	4′					
Slate	?					
Stray 3d SS., gray		9	"	1127	=	13
Soapstone, or mud rock		1	"	1128	=	12
3d SS., 12′ in the rock		12	"	1140	=	0

[Mr. Morrison says the measurement to the 3d SS. in this well was made three or four times, and is very accurate. It also corresponds with the measurement in another well put down by him near by. He further says that the Maggie well, about 10 rods north-west of the Armstead, and on the same level, is drilled at least 15′ below the 3d SS. The reported depth, 1,166′, is not to the top of the sand, but to the bottom of the well.

Parsons well No. 6, mentioned in Report J, 1874, is on the the hillside just below the Armstead. The difference in elevation is about 125′. It was reported to be 1,155′ deep. Mr. Morrison is certain that this is a mistake. He is well acquainted with the history of the well, and knows that the 3d SS. was found at the proper depth to correspond with the same rock in the Armstead.

Mr. Parsons does not remember the depth of the well, but is quite positive that there was nothing unusual in the stratification at this point, and that the well was only drilled to the horizon of the 3d SS., as shown by other wells in the vicinity. We mention these facts to correct the false impression created by the publication of this incorrect record—that there was a sudden drop in the SS. at this point. Nothing of the kind can be discovered in any of the other wells. J. F. C].

1138. *Cataract Well, No. 1.*

South of Lawrenceburg, Perry township, Armstrong county. Authority, A. McCain.

Well mouth above ocean in feet, about					1134
? (Interval unknown)	338	to	338	=	
1st SS. (First Sandstone).....estimated	30	"	368	=	
?	352	"	720	=	
2d SS., estimated	30	"	750	=	
?	200	"	950	=	
Boulder, estimated	15	"	965	=	
?	15	"	980	=	
3d SS	37	"	1017	—	

1139 *Gibson & Ecock Well.*

On Fronsinger farm, Parker township, Butler county. Authority, Edward Casey.

Well mouth above ocean in feet					1382
Clay	14	to	14	=	1368

Surface SS	15	to	29	=	1353
Slate	51	"	80	=	1302
SS., white	7	"	87	=	1295
COAL	3	"	90	=	1292
SS., dark, 15′; white, 35′; dark, 5′	55	"	145	=	1237
COAL	5	"	150	=	1232
SS. (Sandstone)	3	"	153	=	1229
Slate	132	"	285	=	1097
Limestone......**Limestone**	15	"	300	=	1082
COAL	3	"	303	=	1079
Slate	60	"	363	=	1019
SS., white	37	"	400	=	982
Slate	45	"	445	=	937
Bluff SS. "A"	19	"	464	=	918
Slate	10	"	474	=	908
Bluff SS. "B"	18	"	492	=	890
COAL	6	"	498	=	884
Mountain SS., with slate at 568 to 569 and 599 to 607	144	"	642	=	740
Slate	30	"	672	=	710
Shells	20	"	692	=	690
Slate	15	"	707	=	675
SS	12	"	719	=	663
Slate	30	"	749	=	633
Shells	25	"	774	=	608
SS	20	"	794	=	588
Slate	31	"	825	=	557
1st SS	12	"	837	=	545
Slate	85	"	922	=	460
Shells	2	"	924	=	458
Slate	135	"	1059	=	323
SS	3	"	1062	=	320
Slate	90	"	1152	=	230
SS	2	"	1154	=	228
Slate	6	"	1160	=	222
2d SS	10	"	1170	=	212
Red rock	2	"	1172	=	210
SS., fifty foot rock	15	"	1187	=	195
Red rock	2	"	1189	=	193
Slate and shells	8	"	1197	=	185
Red rock	4	"	1201	=	181
SS., white	9	"	1210	=	172
Slate and shells	10	"	1220	=	162
SS., dark	15	"	1235	=	147
Slate	25	"	1260	=	122
SS	30	"	1290	=	92
Slate	5	"	1295	=	87
SS., Blue Monday	5	"	1300	=	82
Red rock	12	"	1312	=	70
SS	4	"	1316	=	66
Red rock	7	"	1323	=	59
SS	12	"	1335	=	47

Slate	10	to	1345	= + 37
SS., boulder	4	"	1349	= + 33
Red rock	2	"	1351	= + 31
Slate	10	"	1361	= + 21
SS., stray	12	"	1373	= + 9
Slate	4	"	1377	= + 5
SS	6	"	1383	= − 1
Slate	3	"	1386	= − 4
SS	4	"	1390	= − 8
Slate	3	"	1393	= − 11
SS	6	"	1399	= − 17
Slate	3	"	1402	= − 20
SS., oil sandrock	16	"	1418	= − 36

1140. *Arrowsmith Well.*

1875.

On Fletcher farm, between Petrolia and Martinsburg, Parker township, Butler county. Authority, Mr. Arrowsmith.

Well mouth above ocean in feet				+1129
? (Interval unknown)	12	to	12	= +1117
Limestone...... **Limestone**	10	"	22	= +1107
?	1138	"	1160	= − 31
3d SS. (Third Sandstone)	15	"	1175	= − 46
?	42	"	1217	= − 88
?	4	"	1221	= − 92
Stray 4th SS	9	"	1230	= − 101
Slate	6	"	1236	= 107
4th SS	20	"	1256	= 127
Shale ...... pocket,	44	"	1300	= 171

Best production, 5 barrels per day. Green oil from the 3d SS., pumping at 1,175′. Measurement at 1,217′ made steel wire.

After pumping several months it was put down to the 4th SS., securing a large flow of gas, sufficient to run 4 boilers, but not materially increasing the production of oil.

This well is but a short distance from the Edward Bennett well given below.

1141. *Edward Bennett Well, No.* 1.

October 13, 1875.

On Fletcher farm, between Petrolia and Martinsburg, Parker township, Butler county. Authority, James B. Bachell.

Well mouth above ocean in feet				+1138
Conductor	16	to	16	= +1122
Limestone...... **Limestone**	11	"	27	= +1111

Slate	[illegible]		[illegible]	[illegible]
Mountain SS	[illegible]	"	[illegible]	= + [illegible]
?	355	"	750	= + 388
1st SS	60	"	810	= + 328
?	115	"	925	= + 213
2d SS	30	"	955	= + 183
?	45	"	1000	= + 138
SS. (30′ rock)	30	"	1030	= + 108
?	55	"	1085	= + 53
SS., Blue Monday	15	"	1100	= + 38
Slate	25	"	1125	= + 13
SS., boulder	15	"	1140	= − 2
Slate	27	"	1167	= − 29
3d SS	13	"	1180	= − 42
? pocket,	3	"	1183	= − 45

Best production, 45 barrels per day.

1142. *Brawley Well, No.* 1.

October 17, 1875.

On Fletcher farm, between Martinsburg and Petrolia, Parker township, Butler county. Authority, ——.

Well mouth above ocean in feet				+1127
Conductor	18	to	18	= +1109
Limestone......Limestone	10	"	28	= +1099
Slate	217	"	245	= + 882
Mountain SS	125	"	370	= + 757
? (Interval unknown)	555	"	925	= + 202
2d SS	30	"	955	= + 172
?	217	"	1172	= − 45
3d SS	18	"	1190	= − 63

Salt water at 1,004′.

Best production, 100 barrels per day.

1143. *Good Enough Well, No.* 2.

On A. L. Campbell farm, Fairview township, Butler county. Authority, ——.

Well mouth above ocean in feet				+1171
?	1235	to	1235	= − 64
3d SS	15	"	1250	= − 79
Slate, reddish	75	"	1325	= − 154
4th SS (gas, no oil)	16	"	1341	= − 170

Drilled dry. A good third sand well. Increase of gas in the 4th SS., but no improvement in oil.

CHAPTER XIX.

GREECE; MODOC; M'CAFFERTY.

1144. *Morrison Well, No.* 1.

Near Greece City, Concord township, Butler county. Authority, ——.

Well mouth above ocean in feet			+1110
? (Interval unknown)	10	to 10	= +1100
SS. (Sandstone)	60	" 70	— +1040
?	90	" 160	= + 950
Limestono......**Limestone**	20	" 180	= + 930
?	260	" 440	= + 670
Mountain SS	140	" 580	= + 530
?	320	" 900	= + 210
1st SS., estimated	20	" 920	= + 190
?	170	" 1090	= + 20
2d SS	60	" 1150	= — 40
Slate	5	" 1155	= — 45
SS., fifty-foot rock	50	" 1205	= — 95
Slate	25	" 1230	= — 120
Red rock	25	" 1255	= — 145
SS., boulder	25	" 1280	= — 170
Slate and red rock, alternating	89	" 1369	= — 259
Stray 3d SS	20	" 1389	= — 279
Slate	25	" 1414	= — 304
3d SS. (9′ in sand)	9	" 1423	= — 313

1145. *Woods and Ripley Well, No.* 2.

On D. Barnhart farm, near Greece City, Concord township, Butler county. Authority, one of the drillers; from memory.

Well mouth above ocean in feet			+1137
?	960	to 960	= + 177
1st SS	50	" 1010	= + 127
?	240	" 1250	= — 113
2d SS	35	" 1285	= — 148

?	205	to	1490	=	— 858
3d SS. (12′ good)	40	"	1530	=	— 898

Limestone between 300′ and 400′. No Stray 3d SS. found.

1146. *Say Well.*

On J. Campbell farm, Concord township, Butler county, near Greece City. Authority, ——.

Well mouth above ocean in feet				
? (Interval unknown)	250	to	250	=
Limestone...... **Limestone**	12	"	262	=
?	202	"	464	=
Mountain SS	30	"	494	=
?	306	"	800	=
1st SS	25	"	825	=
Slate and shells	275	"	1100	=
SS	50	"	1150	=
Slate	10	"	1160	=
SS, fifty foot rock	50	"	1210	=
?	157	"	1367	=
Red rock, estimated	10	"	1377	=
Stray 3d SS	10	"	1387	=
Slate	25	"	1412	=
3d SS. (35′ in sand)	35	"	1447	=

1147. *Sweepstakes Well.*

August 8, 1873.

Harper farm, Troutman district, Butler county. Authority, I. E. Dean.

Well mouth above ocean in feet				
Conductor	18	to	18	=
Slate	70	"	88	=
SS	30	"	118	=
Slate	85	"	203	=
Limestone, brown...... **Limestone**	18	"	221	=
Coal	3	"	224	=
Slate	20	"	244	=
SS	57	"	301	=
Slate	89	"	390	=
Coal, "peacock"	4	"	394	=
SS	168	"	562	=
Slate, shelly and gray	211	"	773	=
SS	130	"	903	=
Slate	100	"	1003	=
SS., gray	12	"	1015	=
Slate	88	"	1103	=

SS., salt water	40	to	1143	=
Red rock	20	"	1163	=
Slate, black	80	"	1243	=
SS., gray	20	"	1263	=
Slate	25	"	1288	=
SS., greenish	15	"	1303	=
Slate	70	"	1373	=
SS., gray	6	"	1379	=
Slate	24	"	1403	=
SS., grey, no oil	10	"	1413	=
Slate, black	15	"	1428	=
Red rock	15	"	1443	=
Slate, gray	27	"	1470	=
SS., pebble	5	"	1475	=

Drilled dry. Cased at 510′. Best production, 1,650 barrels per day. Gas sufficient to fire 6 boilers. Green oil. Gravity, 46°.

1148. *Jenkins Well* (*No.* 2 ?).

On D. Jenkins' farm, Fairview township, Butler county. Authority, N. B. Parker, contractor.

Well mouth above ocean in feet					
? (Interval unknown)		75	to	75	=
COAL		—	"	75	=
?		55	"	130	=
COAL		—	"	130	=
?		305	"	435	=
Limestone, say...... **Limestone**		10	"	445	=
? (containing "60" and "40 foot rocks".		205	"	650	=
SS., Mountain sand		180	"	830	=
1st SS., shells					
2d SS	6				
Slate	8				
SS., fifty foot rock	—				
Slate	4				
SS., thirty foot rock					
Boulder	25				
Stray and 3d SS	20				
Soft slate	30				
Interval containing above rocks and slates not mentioned		805	"	1635	=
4th SS., 15′ in sand		15	"	1650	=

Drilled dry. Cased at 657′. No red rock and no Blue Monday found in this well.

M'Cafferty Farm Wells.

1873-1876.

On M'Cafferty farm, (H. L. Taylor & Co.,) Fairview township, Butler county. Copied from the books of Mr. Peter Schrieber.

1149. *Well No. 2.*

Well mouth above ocean in feet				
Casing	**460**	**to**	**460**	=
? (Interval unknown)	**1035**	"	**1495**	=
3d SS. (Third Sandstone)	**20**	"	**1515**	=
?	**55**	"	**1570**	=
4th SS	**18**	"	**1588**	=

1150. *Well No. 3.*

Well mouth above ocean in feet				
Casing	**459**	**to**	**459**	=
?	**1047**	"	**1506**	=
3d SS	**21**	"	**1527**	=
?	**53**	"	**1580**	=
4th SS	**23**	"	**1603**	=
? pocket,	**19**	"	**1622**	=

1151. *Well No. 4.*

Well mouth above ocean in feet				
Casing	428	to	428	=
? (Gas at 1382')	1049	"	1477	=
3d SS	22	"	1499	=
?	58	"	1557	=
4th SS	19	"	1576	=
? pocket,	11	"	1587	=

1152. *Well No. 5.*

Well mouth above ocean in feet				
Casing	493	to	493	=
?	1042	"	1535	=
3d SS	20	"	1555	=
?	50	"	1605	=
4th SS	23	"	1628	=
? pocket,	18	"	1646	=

1153. *Well No. 6.*

Well mouth above ocean in feet				
Casing	539	to	539	=
?	1023	"	1562	=

3d SS	21	to	1583	=
?	52	"	1635	=
4th SS	27	"	1662	=

1154. *Well No.* 7.

Well mouth above ocean in feet				
Casing	368	to	368	=
? (Interval unknown)	1060	"	1428	=
3d SS. (Third Sandstone)	21	"	1449	=
?	54	"	1503	=
4th SS	20	"	1523	=
?	15	"	1538	=

1155. *Well No.* 8.

Well mouth above ocean in feet				
Casing	603	to	603	=
?	928	"	1531	=
3d SS	18	"	1549	=
?	59	"	1608	=
4th SS	18	"	1626	=
? ... pocket,	68	"	1694	=

1156. *Well No.* 9.

Well mouth above ocean in feet				
Casing	553	to	553	=
?	911	"	1464	=
3d SS	20	"	1484	=
?	43	"	1527	=
4th SS	20	"	1547	=
? ... pocket,	12	"	1559	=

1157. *Well No.* 10.

Well mouth above ocean in feet				
Casing	400	to	400	=
?	1040	"	1440	=
3d SS	24	"	1464	=
?	53	"	1517	=
4th SS., hard and close, no oil	19	"	1536	=
? ... pocket,	10	"	1546	=

1158. *Well No.* 11.

Well mouth above ocean in feet				
Casing (limestone at 280'?)	525	to	525	=
?	906	"	1431	=

3d SS., gray, no oil	22	to 1453	=
?	34	" 1487	=
Stray 4th SS., good, gas and oil	14	" 1501	=
?	2	" 1503	=
4th SS., good	20	" 1523	=
? pocket,	16	" 1539	=

CHAPTER XX.

CRISWELL; MONTEREY; BRADY'S BEND.

1159. *Boss Well.*

July 14, 1874.

On Parker farm, at Criswell City, Perry township, Armstrong county. Authority, Mr. Criswell.

Well mouth above ocean in feet					+1279
? (Interval unknown)	190	to	190	=	+1089
Limestone **Limestone**	10	"	200	=	+1079
?	200	"	400	=	+ 879
Mountain SS. (Sandstone)	200	"	600	=	+ 679
?	175	"	775	=	+ 504
SS	50	"	825	=	+ 454
?	277	"	1102	=	+ 177
1st SS	36	"	1138	=	+ 141
?	37	"	1175	=	+ 104
SS., pebbly	5	"	1180	=	+ 99
?	5	"	1185	=	+ 94
Red rock	5?	"	1190	=	+ 89
?	107	"	1297	=	— 18
2d SS	6	"	1303	=	— 24
Red rock	15	"	1318	=	— 39
?	7	"	1325	=	— 46
SS	3	"	1328	=	— 49
?	7	"	1335	=	— 56
SS	5	"	1340	=	— 61
?	9	"	1349	=	— 70
SS., Blue Monday	5	"	1354	=	— 75
Red rock	5	"	1359	=	— 80
?	3	"	1362	=	— 83
Slate with 3 hard shells	13	"	1375	=	— 96
?	10	"	1385	=	— 106
3d SS., pebbly, gas and oil	12	"	1397	=	— 118
?	8	"	1405	=	— 126
Red rock, pale red	5?	"	1410	=	— 131
?	15	"	1425	=	— 146
SS	5	"	1430	=	— 151

?	32	to	1462	= — 183
SS., say	5	"	1467	= — 188
?	3	"	1470	= — 191
4th SS., 12′ in sand	12	"	1482	= — 203

Drilled dry. Cased at 411′. Gas at 1,000′ and in 3d sand. Shells at 1,224′, 1,262′, and 1,269′, with 8′ of red rock between 1,224′ and 1,262′.

Best production, 1,900 to 2,500 barrels per day. Green oil.

Hunter & Cummings' Wells.

August, 1875.

On Wm. Crawford farm, near Criswell City, Perry township, Armstrong county. Authority, Hunter & Cummings.

1160. *Well No.* 10.

Well mouth above ocean in feet				+1320
? (Interval unknown)	100	to	100	= +1220
COAL	10	"	110	= +1210
?	110	"	220	= +1100
Limestone......**Limestone**	15	"	235	= +1085
?	170	"	405	= + 915
Mountain SS. (Sandstone)	200	"	605	= + 715
?	550	"	1155	= + 165
2d SS., estimated	35	"	1190	= + 130
?	216	"	1406	= — 86
3d SS., estimated	15	"	1421	= — 101
Shale	6	"	1427	= — 107
SS., estimated	10	"	1437	= — 117
?	63	"	1500	= — 180
SS. shell, estimated	5	"	1505	= — 185
?	2	"	1507	= — 187
4th SS	20	"	1527	= — 207

Cased at 433′. Loose pebbles and oil at 1,508′. Oil at 1,514′ 8″. Stopped in hard, firm shale at 1,527′.

1161. *Well No.* 9.

Well mouth above ocean in feet				+1384
?	308	to	308	= +1076
Limestone......**Limestone**	15	"	323	= +1061
? (gas)	775	"	1098	= + 286
?	469	"	1567	= — 183
SS., shell over 4th SS	5	"	1572	= — 188
?	3	"	1575	= — 191
4th SS	18	"	1593	= — 209
? .... pocket,	25	"	1618	= — 234

Oil at 1,576′.

1162. *Cummings Well, No.* 1.

March, 1874.

On Adam Peters farm, Perry township, Armstrong county. Copied from Hunter & Cummings' books.

Well mouth above ocean in feet				+1230
? (Interval unknown)	30	to	30	= +1200
COAL	—	"	30	= +1200
?	55	"	85	= +1145
COAL	—	"	85	= +1145
?	34	"	119	= +1111
Limestone......**Limestone**	15	"	134	= +1096
?	181	"	315	= + 915
Mountain SS	183	"	498	= + 732
?	20	"	518	= + 712
SS., stray	41	"	559	= + 671
?	115	"	674	= + 556
SS., stray	76	"	750	= + 480
?	334	"	1084	= + 146
1st SS	35	"	1119	= + 111
Red rock	5	"	1124	= + 106
?	81	"	1205	= + 25
SS	12	"	1217	= + 13
?	7	"	1224	= + 6
2d SS	15	"	1239	= — 9
Red rock	40	"	1279	= — 49
?	28	"	1307	= — 77
3d SS	24	"	1331	= — 101
?	41	"	1372	= — 142
Red rook	8	"	1380	= — 150
SS., pebbly	2	"	1382	= — 152
? (including boulder)	18	"	1400	= — 170
4th SS	25	"	1425	= — 195
Red rock, very red	10	"	1435	= — 205
Slate	8	"	1443	= — 213
SS., hard and gray	8	"	1451	= — 221
Slate, red on top, then black	40	"	1491	= — 261

Drilled dry. Cased at 384′. Gas sufficient to fire several boilers.

Best production, 4 barrels per day.

Three feet of "corn meal pebble" at top of 4th SS., from 1,400′ and 1,403′. One foot of slate at 1,413′. Hard streak and first show of oil at 1,415′, and second show at 1,419′.

1163. *Monterey Well, No.* 1.

1875.

On J. B. Binkerd farm, about 2 miles north of Criswell City, Perry township, Armstrong county. Authority, W. J. Brundred.

Well mouth above ocean in feet				
? (Interval unknown)	25	to	25	=
Limestone **Limestone**	20	"	45	=
? (3' feet of coal at 70')	35	"	80	=
SS. Sandstone)	20	"	100	=
SS. and shells (1 foot of coal at 210')	100	"	200	=
SS.	39	"	239	=
Slate	10	"	249	=
Mountain SS.	300	"	549	=
Slate, shale and shells	67	"	616	=
SS. (oil show)	20	"	636	=
? (stinking gas)	327	"	963	=
SS.	10	"	973	=
Slate	22	"	995	=
SS. (oil show)	35	"	1030	=
Red rock	4	"	1034	=
SS.	56	"	1090	=
Red rock	24	"	1114	=
?	25	"	1139	=
SS., hard	12	"	1151	=
Red rock	5	"	1156	=
Slate	35	"	1191	=
SS. shell	1	"	1192	=
Slate	4	"	1196	=
SS., green and pebbly	9	"	1205	=
Red rock	5	"	1210	=
SS., blue and hard	1	"	1211	=
Slate, shells and red rock	20	"	1231	=
3d SS. (oil show at 1250')	20	"	1251	=
Slate, green and sandy	5	"	1256	=
SS., gray and white	8	"	1264	=
Blue slate and red rock	28	"	1292	—
SS., shells and pebbles	10	"	1302	=
Slate	14	"	1316	=
4th SS. (gas, 1321'; oil, 1324')	13	"	1329	=
Slate	9	"	1338	=
4th SS. (gas and oil at 1340')	4	"	1342	=
Slate, shells and red rock	52	"	1394	=

This well was unproductive.

1164. *Monterey Well, No.* 2.

1875.

On J. K. Binkerd farm, 2 miles north of Criswell City, Perry township, Armstrong county. Authority; W. J. Brundred.

Well mouth above ocean in feet				
? (Interval unknown)	16	to	16	=
COAL	4	"	20	=
Slate, shelly	47	"	67	=
Limestone......**Limestone**	20	"	87	=
Slate	16	"	103	=
COAL	3	"	106	=
Slate	8	"	114	=
COAL	4	"	118	=
Slate, shelly	18	"	136	=
SS. (Sandstone) white	30	"	166	=
Slate, shelly	28	"	194	=
SS.	8	"	202	=
Slate, shelly	60	"	262	=
SS., dark gray and hard	13	"	275	=
Slate	1	"	276	=
SS. (salt water at 277′)	160	"	436	=
Slate	188	"	624	=
1st SS., gray and loose (gas at 609′)	60	"	684	=
Shelly slate	356	"	1040	=
2d SS	4	"	1044	=
Red rock	4	"	1048	=
SS., slate and shells	52	"	1100	=
Red rock	6	"	1106	=
SS., blue	4	"	1110	=
Slate	30	"	1140	=
SS., gray	15	"	1155	=
Slate	5	"	1160	=
Red rock	18	"	1178	=
Slate, shelly	46	"	1224	=
SS., hard	8	"	1232	=
Slate	2	"	1234	=
SS., hard	19	"	1253	=
Slate	15	"	1268	=
SS., pebbly	1	"	1269	=
Slate	4	"	1273	=
3d SS. (oil show)	8	"	1281	=
Slate	2	"	1283	=
Slate, shelly	18	"	1301	=
Red rock	5	"	1306	=
Slate, shelly	22	"	1328	=
SS., gray	4	"	1332	=
Slate	1	"	1333	=
4th SS	20	"	1353	=
Slate	10	"	1363	=

SS., pebbly	3	to	1366	+
Slate, black	24	"	1390	+
Red rock	18	"	1408	+
Slate	16	"	1424	+

Drilled dry. Cased at 287′. Gas at 609′. No oil.

1165. *Well No.* 4.

1870.

On the tract of the Brady's Bend Iron Company, Brady's Bend township, Armstrong county. Authority, J. P. Lesley.

Well mouth above ocean in feet				+ 850
? (Interval unknown)	50	to	50	= + 800
SS. (Sandstone)	190	"	240	= + 610
?	658	"	898	= — 48
SS	49	"	947	= — 97
Slate—gray SS. at 965′, black rock 992′	51	"	998	= — 148
SS., black at 998′, gray at 1,000′	15	"	1013	= — 163
Slate	25	"	1038	= — 188
SS., hard	88	"	1126	= — 276
SS., red SS	10	"	1136	= — 286
SS., black	5	"	1141	= — 291
SS., gray	3	"	1144	= — 294
Shale, mud rock	1	"	1145	= — 295
Slate	115	"	1260	= — 410

Shelly at 1,148′, 1,172′ and 1,211′. Trace of oil at 1220′. Unproductive.

1166. *Well No.* 5.

1870.

On the tract of the Brady's Bend Iron Company, Brady's Bend township, Armstrong county. Authority, John Worthington.

Well mouth above ocean in feet				+ 852
?	45	to	45	= + 807
Mountain SS	170	"	215	= + 637
?	110	"	325	= + 527
SS., gray	70	"	395	= + 457
Slate	320	"	715	= + 137
SS	20	"	735	= + 117
Slate	15	"	750	= + 102
Red rock	5	"	755	= + 97
?	20	"	775	= + 77
SS., pebbly on top	10	"	785	= + 67
Slate	10	"	795	= + 57

SS	10	to 805	= + 47
Red rock	3	" 808	= + 44
SS., gray	12	" 820	= + 32
Slate,	2	" 822	= + 30
SS	4	" 826	= + 26
Red rock	1	" 827	= + 25
SS	73	" 900	= — 48
?	30	" 930	= — 78
Red rock	9	" 939	= — 87
SS., shelly at 948′	15	" 954	= — 102
?	11	" 965	= — 113
Slate	7	" 972	= — 120
Red rock	14	" 986	= — 134
SS	29	" 1015	= — 163
Dark rock	11	" 1026	= — 174
SS., gray, 3′ red on top	24	" 1050	= — 198
Slate, shelly at 1,055′	25	" 1075	= — 223
3d SS	5	" 1080	= — 228
Slate and shells	4	" 1084	= — 232
SS., pebbly	6	" 1090	= — 238
SS	10	" 1100	= — 248

Soft at 460′, gray at 490′, shelly at 530′ and 640′. White SS. 827′–835′, gray to 848′, blue at 850′, black at 860′.

Best production, 7 barrels per day.

CHAPTER XXI.

PETROLIA TO ST. JOE.

1167. *Nesbitt Well, No.* 1.

On J. Blaney farm, near Petrolia, Fairview township, Butler county. Authority, ———.

Well mouth above ocean in feet				+1179
Conductor	15	to	15	= +1164
Limestone	25	"	40	= +1139
Coal, estimated	2	"	42	= +1137
SS. (Sandstone) green	65	"	107	= +1072
? (Interval unknown)	293	"	400	= + 779
Mountain SS	140	"	540	= + 639
? (with 1st SS., and 2d SS., and large red rock)	656	"	1196	= − 17
SS., boulder	35	"	1231	= − 52
Slate	25	"	1256	= − 77
Stray SS	15	"	1271	= − 92
Slate	10	"	1281	= − 102
3d SS	22	"	1303	= − 124
? (with slate and red rock)	67	"	1370	= − 191
4th SS. (with 6′ slate near middle)	30	"	1400	= − 221

Drilled dry. Cased at 440′.

Best production, 900 barrels per day; 4th sand oil.

1168. *Hazelwood Well, No.* 13.

On Sheakley farm, near Petrolia. Copied from Company's books.

Well mouth above ocean in feet				+1226
?	420	to	420	= + 806
Mountain SS	160	"	580	= + 646
Slate	20	"	600	= + 626
Shells	75	"	675	= + 551
Slate	50	"	725	= + 501

Shells	10	to	735	=	+ 491
Slate, shelly	165	"	900	=	+ 326
1st SS	25	"	925	=	+ 301
Slate	160	"	1085	=	+ 141
2d SS	24	"	1109	=	+ 117
Slate, shelly	16	"	1125	=	+ 101
SS., fifty foot rock	35	"	1160	=	+ 66
Stray SS. and shell	40	"	1200	=	+ 26
SS., Blue Monday	8	"	1208	=	+ 18
Slate, shelly	7	"	1215	=	+ 11
Red rock	15	"	1230	=	— 4
Slate, shelly	15	"	1245	=	— 19
Red rock	5	"	1250	—	— 24
SS., boulder	50	"	1300	=	— 74
Slate	20	"	1320	=	— 94
Shell	5	"	1325	=	— 99
3d SS	35	"	1360	=	— 134
Slate, with shells and red rock	60	"	1420	=	— 194
4th SS., 3′ in the sand	3	"	1423	=	— 197

1169. *Spence Well.*

On Wilson farm, Fairview township, Butler county. Authority, ———.

Well mouth above ocean in feet					+1206
? (Interval unknown)	20	to	20	=	+1186
COAL	4	"	24	=	+1182
?	36	"	60	=	+1146
COAL	5	"	65	=	+1141
?	10	"	75	=	+1131
Limestone, estimated **Limestone**	10	"	85	=	+1121
?	815	"	900	=	+ 306
1st SS. (First Sandstone)	35	"	935	=	+ 271
?	185	"	1120	=	+ 86
2d SS	20	"	1140	=	+ 66
Slate	30	"	1170	=	+ 36
SS., fifty foot rock	50	"	1220	=	— 14
Red rock	3	"	1223	=	— 17
Slate	27	"	1250	=	— 44
SS., thirty foot rock	30	"	1280	=	— 74
?	35	"	1315	=	— 109
SS;, boulder thickness unknown	..	"	....	=	— ...
?	25	"	1340	=	— 134
3d SS	30	"	1370	=	— 164
Slate	26	"	1396	=	— 190
4th SS	25	"	1421	=	— 215

1170. *Mattison and M'Donald Well.*

December 4, 1875.

On M'Clyman's farm, Fairview township, Butler county. Authority, John Davitt.

Well mouth above ocean in feet				+1244
Conductor (?) 10′, shale 4′, COAL 4′	18	to	18	= +1226
Slate	23	"	41	= +1203
COAL	4	"	45	= +1199
Slate	25	"	70	= +1174
Bluff SS. (Sandstone)	75	"	145	= +1099
Slate	20	"	165	= +1079
Limestone...... Limestone	20	"	185	= +1059
Slate	143	"	328	= + 916
SS., forty foot rock	40	"	368	= + 876
Slate	110	"	478	= + 766
Mountain SS.	150	"	628	= + 616
Slate	122	"	750	= + 494
1st SS	20	"	770	= + 474
Slate	200	"	970	= + 274
SS	10	"	980	= + 264
Slate	185	"	1165	= + 79
2d SS	20	"	1185	= + 59
Red rock	5	"	1190	= + 54
Slate	80	"	1270	= — 26
SS., Blue Monday	10	"	1280	= — 36
Red rock	20	"	1300	= — 56
Slate	20	"	1320	= — 76
SS., boulder	10	"	1330	= — 86
Slate	20	"	1350	= — 106
Stray 3d SS	25	"	1375	= — 131
Slate	15	"	1390	= — 146
3d SS	12	"	1402	= — 158
Slate	58	"	1460	= — 216
Stray 4th SS	8	"	1468	= — 224
Slate	2	"	1470	= — 226
4th SS., 20′ in sand	20	"	1490	= — 246

Cased at 470′. Gas sufficient to fire one boiler.

Best production, 75 barrels per day. Amber green oil.

1171. *Emerson & M'Cloud Well, No. 1.*

On L. Riddle farm, about one-half a mile south of Karns City. Authority, ———.

Well mouth above ocean in feet				+1249
?	80	to	80	= +1169
COAL	3	"	83	= +1166
?	117	"	200	= +1049

SS., bluff sand	100	to	300	=	+ 949
?	50	"	350	=	+ 899
Limestone	10	"	360	=	+ 889
?	390	"	750	=	+ 499
1st SS	40	"	790	=	+ 459
?	360	"	1150	=	+ 99
2d SS	30	"	1180	=	+ 69
?	254	"	1434	=	— 185
3d SS	20	"	1454	=	— 205

1172. *Stoughton Well, No.* 2.

On Widow Hemphill farm, Donegal township, Butler county. Authority, ——————.

Well mouth above ocean in feet					+1176
Conductor	20	to	20	=	+1156
Bluff SS., estimated	20	"	40	=	+1136
? (Interval unknown)	1110	"	1150	=	+ 26
2d SS. (Second Sandstone)	20	"	1170	=	+ 6
?	165	"	1335	=	— 159
Shells, "Blue Monday, Boulder or 50′ rock"	50	"	1385	=	— 209
Shale	5	"	1390	=	— 214
Stray, 3d SS	10	"	1400	=	— 224
?	20	"	1420	=	— 244
3d SS	12	"	1432	=	— 256
? pocket,	8	"	1440	=	— 264

Drilled Dry. Cased at 500′.

1173. *Mead Well.*

——————.

On Now farm, near St. Joe, Donegal township, Butler county. Authority, Mr. Wyatt; from memory.

Well mouth above ocean in feet					+1294
?	40	to	40	=	+1254
COAL	5	"	45	=	+1249
?	300	"	345	=	+ 949
Limestone......**Limestone**	20	"	365	=	+ 929
?	35	"	400	=	+ 894
SS., 60′ rock	60	"	460	=	+ 834
?	35	"	495	=	+ 799
SS., 40′ rock	40	"	535	=	+ 759
Slate	20	"	555	=	+ 739
Mountain SS. Cased at 537′	175	"	730	=	+ 564
Slate	405	"	1135	=	+ 159
1st SS	25	"	1160	=	+ 134
Slate	110	"	1270	=	+ 24

2d SS. (Second Sandstone)......................	25	to			— 1
Red rock....................................	5	"	1300	=	— 6
SS., 50′ rock..................................	40	"	1340	=	— 46
Slate...	20	"	1360	=	— 66
SS., 30′ rock..................................	25	"	1385	=	— 91
Slate...	40	"	1425	=	— 131
SS., boulder..................................	20	"	1445	=	— 151
Slate...	10	"	1455	=	— 161
SS., Blue Monday............................	5	"	1460	=	— 166
Slate...	40	"	1500	=	— 206
Stray 3d SS..................................	30	"	1530	=	— 236
Slate...	25	"	1555	=	— 261
3d SS., 10′ in sand..........................	10	"	1565	=	— 271

CHAPTER XXII.

SOUTH OF ST. JOE.

1174. *Parker and Overy Well.*

April 5, 1876.

On Peter Duffy farm, south-west corner of Donegal township, Butler county. Authority, John Davitt.

Well mouth above ocean in feet				
? (Interval unknown)	9	to	9	=
Surface SS. (Sandstone)	50	"	59	=
Coal	3	"	62	=
Bluff SS	10	"	72	=
Slate, black	249	"	321	=
Limestone......**Limestone**	20	"	341	=
Slate, black	74	"	415	—
SS., "60′ rock"	30	"	445	=
Slate	50	"	495	=
SS., "40′ rock"	30	"	525	—
SS., "Mountain sand"	445	"	970	=
Slate	205	"	1175	=
1st SS., gas sand	15	"	1190	=
Slate, with hard black shells	130	"	1320	=
2d SS.	20	"	1340	=
Slate	5	"	1345	=
Red SS	2	"	1347	=
SS., "50′ rock"	34	"	1381	=
Slate	1	"	1382	=
SS., "30′ rock"	25	"	1407	=
Slate	60	"	1467	=
SS., "Blue Monday"	10	"	1477	=
Shale	2	"	1479	=
SS., boulder	13	"	1492	=
Slate	40	"	1532	=
Stray 3d SS	20	"	1552	=
Slate	13	"	1565	=
3d SS	19	"	1584	=

Cased at 525′. Gas sufficient to fire 2 boilers. Best production, 50 barrels per day.

1175. *Thompson Gas Well.*

1875.

Robert Thompson farm, Clearfield township, Butler county, 2 miles south of St. Joe, and adjoining the Easterling farm. Authority, S. M'Gara.

Well mouth above ocean in feet				+1162
Conductor	15	to	15	= +1147
Slate	8	"	23	= +1139
SS., surface sandstone, coal show 30′	100	"	123	= +1039
Slate, good drilling	92	"	215	= + 947
Limestone, soft and poor..**Limestone**	15	"	230	= + 932
Slate, good drilling	60	"	290	= + 872
SS. (Sandstone) white, "open"	40	"	330	= + 832
Slate	60	"	390	= + 772
SS., "60′ SS.,"	90	"	480	= + 682
Slate	50	"	530	= + 632
Mt. SS., little salt water top and bottom	210	"	740	= + 422
Slate	100	"	840	= + 322
SS., little salt water and gas	22	"	862	= + 300
Slate, shelly	150	"	1012	= + 150
SS., very hard	22	"	1034	= + 128
Slate, shelly	143	"	1177	= — 15
SS., very dark, little salt water	15	"	1192	= — 30
Red rock, very hard	7	"	1199	= — 37
Slate	8	"	1207	= — 45
SS., "50′ rock," top, hard; bottom, soft	50	"	1257	= — 95
Slate	20	"	1277	= — 115
SS., "30′ rock," red at bottom	20	"	1297	= — 135
Slate	60	"	1357	= — 195
SS. white	5	"	1362	= — 200
Red rock, hard	15	"	1377	= — 215
SS., boulder	10	"	1387	= — 225
Slate	38	"	1425	= — 263
SS., "Corn-meal" or stray, good	21	"	1446	= — 284
Slate	10	"	1456	= — 294
3d SS., (measured)	30	"	1486	= — 324
?	52	"	1538	= — 376
4th SS., gas, no oil	20?	"	1558?	= — 396

Drilled dry. Cased at 461′. The 3d SS., was full of small pebbles near its top, but became fine, white and sharp toward the bottom. Oil was struck near the top of this sand. The well was tubed and pumped for four months, producing 8 barrels per day of good lively oil. The tubing was then drawn and the drill run down to the 4th SS., which was found at 1,538′. A powerful vein of gas was encountered here, the rig caught fire and burned down, and as there is no oil with the gas the well is now only used as a gas well, supplying fuel to 15 or 20 boilers in the neighborhood.

1176. *Dugan Well.*

October, 1876.

Near Jeffersonville, Clearfield township, Butler Co., near the Humes Well. Authority, Mark Spellacy; from memory.

Well mouth above ocean in feet					
Conductor	11	to	11	=	
SS. (Sandstone)	100	"	111	=	
Slate, with limestone and cannel coal	139	"	250	=	
SS. (30′ of slate in middle)	275	"	525	=	
Slate	125	"	650	=	
Slate, shelly, with small sands	720	"	1370	=	
2d SS. (salt water and show of oil)	70	"	1440	=	
Slate	10	"	1450	=	
SS., "50-foot rock," small streak red	40	"	1490	=	
Slate	15	"	1505	=	
SS., 30-foot rock	12	"	1517	=	
Slate	25	"	1542	=	
SS., Blue Monday	10	"	1552	=	
Red rock	12	"	1564	=	
SS., boulder	15	"	1579	=	
Slate	25	"	1604	=	
Stray SS. (*a*)	38 ?	"	1642 ?	=	
Slate	18 ?	"	1660 ?	=	
3d SS	30 ?	"	1690 ?	=	
Slate	40 ?	"	1730 ?	=	
SS	20 ?	"	1750 ?	=	

Drilled dry. Cased at 525′.

(*a*) The well was drilling in this sand at the time the record was given, and the remaining figures are supposititious. They show the position and thickness of the strata as Mr. Spellacy expected to find them if they agreed with his idea of the same rocks in the Humes Well, which was about one-fourth of a mile from the Dugan.

1177. *Humes, or O'Connor Well.*

Clearfield township, Butler county. Authority, ——.

Well mouth above ocean in feet					1124
?	85	to	85	=	1039
Coal	2	"	87	=	1037
?	1188	"	1275	=	— 151
2d SS	70	"	1345	=	— 221

Slate	4	to 1349	= — 225
SS., red rock	8	" 1357	= — 233
Slate	40	" 1397	= — 273
?	100	" 1497	= — 373
SS., boulder	25	" 1522	= — 398
Slate	10	" 1532	= — 408
?	20	" 1552	= — 428
SS., stray, pebble and sand	37	" 1589	= — 465
Slate	3	" 1592	= — 468
3d SS	27	" 1619	= — 495
Slate	18	" 1637	= — 513
SS., blue	6	" 1643	= — 519
Slate shell	36	" 1679	= — 555

[The accuracy of the above record may be questioned. The latter part at least seems somewhat doubtful.

Mr. Wiser, who has sunk several wells near by, says the Humes struck oil at 1,573′, and pumped about 18 barrels per day for some time. It was afterwards put down about 100′ deeper, passing through a close, fine, gray sandstone, but getting no increase of oil or gas.

The Stoughton & Wiser Well, quite near and 18′ below the Humes, found the sand at 1,560′ and passed through it at 1,572′. The indications were unfavorable and it was abandoned, although he thinks it might have been made to pump 3 or 4 barrels of oil per day.

The Barton Well, also close to the Humes, and 120′ higher, was drilled to 1,925′. It was a failure. The Humes oil rock was found in proper place, but yielded nothing. From 35′ to 60′ below it another sand was passed through. This was 13′ thick, but fine, close and dry. Below this there was only slate.]

1178. *Hunter Well.*

1875.

On Schneure farm, Summit township, Butler county. Authority, one of the drillers; from memory.

Well mouth above ocean in feet			+1191
? (Interval unknown)	200	to 200	= + 991
COAL	—	" 200	= + 991
?	215	" 415	= + 776
Limestone, hard—measured **Limestone**	20	" 435	= + 756
?	165	" 600	= + 591
Mountain SS. (Sandstone) shelly	60	" 660	= + 531
..	670	" 1330	= — 139

1st SS., shelly	40	to 1370	= — 179
? (containing red rock, boulder and stray)	275	" 1645	= — 454
3d SS	17	" 1662	= — 471
Slate	6	" 1668	= — 477
Stray 4th SS	10	" 1678	= — 487
Slate	37	" 1715	= — 524
4th SS., close	20	" 1735	= — 544

Drilled dry. Cased at 605′.

No 2d SS. noted in this well. There was 15′ of boulder with 8′ of red rock overlying it.

Best production, about 6 barrels per day. Amber-green oil. Gravity, 46°.

[Mr. Stephen Harley, one of the owners, varies the record thus—3d SS., from 1,635, to 1,650; 4th SS., from 1,690′ to 1,702′. J. F. C.]

1179. *Saxon Station Gas Well.*

Spring of 1874.

At Saxon Station, on the Butler Branch RR., Winfield township, Butler Co. Authority, Mr. Helmbold; from memory.

Well mouth above ocean in feet			+1199
? (Interval unknown)	270	to 270	= + 929
Limestone, black (sandstone?)	60	" 330	= + 869
?	820	" 1150	= + 49
1st SS. (First Sandstone) gas in top	50	" 1200	= — 1
?	220	" 1420	= — 221
2d SS	40	" 1460	= — 261
?	240	" 1700	= — 501
3d SS., shelly and poor	10	" 1710	= — 511
? (to bottom of well)	147	" 1857	= — 658

Drilled dry. Cased at 580′. Gas sufficient to fire 30 boilers. No oil.

The gas flows from the 1st SS. When first struck it ignited and burned down the rig. Deeper drilling did not appear to increase its volume. It still flows with very little, if any, apparent abatement of force [June, 1875.]

1180. *Thorn Creek Well.*

About 1873.

Two miles west of Saxonburg, Jefferson township, Butler county. Authority, F. A. Conkle.

Well mouth above ocean in feet				
? (Interval unknown)	200	to	200	=
Limestone (?)	20	"	220	=
?	260	"	480	=
Limestone......**Limestone**	20	"	500	=
?	730	"	1230	=
SS. (show of oil) estimated	40	"	1270	=
?	155	"	1425	=
SS., pebbly	25	"	1450	=
?	35	"	1485	=
SS. (gas and oil show)	40	"	1525	=
Slate	25	"	1550	=
SS., pebbly, colored	17	"	1567	=
Slate	33	"	1600	=
SS	35	"	1635	=
Slate	40	"	1675	=
SS. (oil show)	20	"	1695	=
Slate	130	"	1825	=

Drilled dry. Cased at 720′. But little gas. No oil.

1181. *Harvey Gas Well.*

1874–5.

Near Larden's Mills, Clinton township, Butler county. Authority, Mr. Smith, driller and part owner.

Well mouth above ocean in feet				
Conductor	8	to	8	=
Slate	20	"	28	=
COAL	6	"	34	=
Slate	46	"	80	=
SS	50	"	130	=
Shale	80	"	210	=
SS	20	"	230	—
Shale	50	"	280	=
Limestone, black......**Limestone**	15	"	295	=
COAL	5	"	300	—
Slate	80	"	380	=
SS	20	"	400	=
Slate	20	"	420	=
SS., "Lightning rock," "Blue Monday"	100	"	520	=
Slate, black (with gas)	40	"	560	=
Slate and shale	100	"	660	=
Mountain SS. (salt water)	160	"	820	=

Slate	25	to	845	=
SS.	40	"	885	=
Shells	15	"	900	=
SS.	20	"	920	=
Slate	180	"	1100	=
SS. (gassy)	15	"	1115	=
Slate	5	"	1120	=
SS., gray (salt water and gas)	20	"	1140	=

Drilled Dry. Cased at 720′. Flowing a tremendous amount of gas, under a pressure of about 250 pounds per square inch.

1182. *Mahan Well.*

1875.

On Mahan farm, Middlesex township, Butler Co. Hart & Conkle, owners. Authority, F. A. Conkle.

Well mouth above ocean in feet				
? (Interval unknown)	200	to	200	=
COAL	4	"	204	=
?	86	"	290	=
COAL	2	"	292	=
Slate	3	"	295	=
Limestone, black …… **Limestone**	20	"	315	=
?	325	"	640	=
COAL	8	"	648	=
?	27	"	675	=
SS., "white limestone" and SS., very hard	90	"	765	=
?	385	"	1150	=
Slate and sand shells	100	"	1250	=
?	100	"	1350	=
SS. (fresh water)	60	"	1410	=
?	60	"	1470	=
SS., black and loose (amber oil and salt water)	10	"	1480	=
SS., gray	50	"	1530	=
?	15	"	1545	=
Red rock	10	"	1555	=
?	10	"	1565	=
SS., boulder	20	"	1585	=
?	38	"	1623	=
SS., pebbly, "corn meal or clover seed"	37	"	1660	=
Slate	40	"	1700	=
SS., pebbly, "pink clover seed"	25	"	1725	=
?	15	"	1740	=
SS., fine and white (oil)	15	"	1755	=
Slate	30	"	1785	=

Drilled dry. Cased at 660′.

The 15′ SS. at 1,740′–1,755′ yielded oil of a dark brown color and 41° gravity for a few days, at the rate of about 10 barrels per day. The well is still drilling [June 6, 1875].

CHAPTER XXIII.

MISCELLANEOUS WELLS.

1183. *Well No.* 1.

Fall of 1865.

On Hall (now Moses) farm, at Limestone, Carrollton township, Cattaraugus county, New York. Authority, Job Moses.

Well mouth above ocean in feet				
Conductor	29	to	29	=
Slate	55	"	84	=
SS. (Sandstone) hard	10	"	94	=
Slate, very soft	10	"	104	=
SS., hard and flinty	6	"	110	=
Slate, shells at 137′ and 144′	64	"	174	=
SS	12	"	186	=
Slate, with shells from 10″ to 3′ thick	34	"	220	=
SS., gray and coarse	25	"	245	=
Slate	9	"	254	=
SS., hard and white, salt water and soot	24	"	278	=
Slate, with soot and gas	55	"	333	=
SS., pebbly, soft, white and brown	20	"	353	=
Slate, with shells, gas and soot	180	"	533	=
SS., hard and flinty	2	"	535	=
SS., light brown, fine oil show	45	"	580	=
Slate, with shells, tested at 587′	110	"	690	=
Slate, "hard blue gritty rock,"	2	"	692	=
SS	13	"	705	=
Slate	350	"	1055	=
SS., two crevices	6	"	1061	=
SS., blue and dark	17	"	1078	=
Slate, sandy	52	"	1130	=
Slate, soft	350	"	1480	=
SS., "nice sand,"	15	"	1495	=
Slate	5	"	1500	=

Gas and oil show at 340′, and again at 1,058′.

The 15′ sand found at 1,480′ was not found in two other wells drilled near this one.

This well was a 4½″ hole, and drilled wet. It produced but little oil.

1184. *Card Well No. 2.*

1866.

Card farm, 2 miles north-east of Clymer, Chautauqua county, N. Y. Authority, Captain Robert Hood.

Well mouth above ocean in feet				
Conductor, through gravel	36	to	36	=
Sandstone	13	"	49	=
Slate, hard	20	"	69	=
Sand shells	20	"	89	=
Slate	7	"	96	=
Sand and slate in thin alternate layers	75	"	171	=
Slate, very soft	20	"	191	=
Sand shell, very hard, white and pebbly	5	"	196	=
Shelly	62	"	258	=
Sand shell, (10″ crevice, oil show)	3	"	261	=
Soapstone and slate	10	"	271	=
Sand shell, (best show of oil)	4	"	275	=
Grey and red rock	18	"	293	=
Slate	18	"	311	=

Wet hole. Unproductive. Salt water at 86′. Show of oil and gas at 96′. Crevice of 4″ at 169′. Oil show at 245′.

Oil Creek Lake, Lumber and Mining Co.'s Wells, Lakeville, Bloomfield township, Crawford county. Authority, Thomas L. Dobbins.

1185. *Well No. 1.*

(Near Saw Mill).

Drilled April to October, 1865.

Well mouth above ocean in feet, about				1400
Drive pipe	13	to	13	=
Slate or shale	100	"	113	=
Rock, hard blue, water vein	1	"	114	=
SS. crust	1	"	115	=
Slate and shale	48	"	163	=
Slate, blue	100	"	263	=
Rock, (probably sand,) hard	52	"	315	=
Slate and gray sand	50	"	365	=
SS., white, (1st SS.,) oil show	2	"	367	=
Soapstone, and soft blue slate with hard streak,	63	"	430	=
Slate, gray, with white sand shells	37	"	467	=
Slate, blue	33	"	500	=
Slate, blue, with flint and white sand	36	"	536	=
Shale and gritty sand shells	14	"	550	=

Slate	55	to	605	=
Slate, with threads of gray sandstone	370	"	975	=

Wet hole. Never tubed nor pumped.

Show of oil at 180′, 367′ and 506′. Some gas at 542′.

1186. *Well No.* 2.

(Near Oil Creek Lake and R. R. water tank).

Drilled January 4th to March 20, 1866.

Authority, Thomas L. Dobbins.

Well mouth above ocean in feet, about				1405
Drive pipe, through coarse gravel and blue clay,	30	to	30	=
Soapstone, light blue, and slate, with hard streaks	103	"	133	=
Blue slate and sand shells	15	"	148	=
Slate, blue, with hard streaks of sand	80	"	228	=
Slate, blue	50	"	278	=
Slate, red	15	"	293	=
Slate, blue	80	"	373	=
SS. (Sandstone) white, show of oil	2	"	375	=
Slate, blue	6	"	381	=
SS. and pebble, very hard, estimated	5	"	386	=
Slate, soft, with hard streaks	114	"	500	=
Slate, blue and rather hard	88	"	588	=
Rock, very hard	2	"	590	=

Wet hole. Never pumped.

At about 100′, oil soot and show of oil, (same as other well at same depth). At 125′, hard streaks and better show of oil. One foot crevice and water at 142′. Fair show of oil at 383′. Gas at 450′.

1187. *Dr. Gibson Well.*

1875.

In the village of Jamestown, Mercer county, Pa. Authority, Dr. William Gibson.

Well mouth above ocean in feet				1060?
Slaty soapstone and hard shells	90	to	90	=
Sandstone, blue, fine	20	"	110	=
Slate, blue	65	"	175	=
2d SS., estimated	25	"	200	=
Slate, blue	90	"	290	=
3d SS	18	"	308	=
Soft slate and soapstone	92	"	400	=
Red rock and hard shale	100	"	500	=

Hard, sandy slate	50	to	550	=
Black slate	200	"	750	=
? (no sands)	315	"	1065	=

Drilled dry. Cased at 260′. Little show of gas in 2d SS., which was coarser and of a lighter color than the 20′ sand above. Struck oil at 295′. The tools were stuck shortly after, and a gallon or more of oil accumulated in the well while waiting for fishing tools. It was of a very dark amber color, and of 29° gravity. The 3d SS. was coarse and pebbly, and pronounced to be first-class oil rock by all who saw it.

1188. *Wheeler Well.*

1873.

Near the town of Mercer, in Jefferson township, Mercer county, Pa. Authority, one of the owners; from memory.

Well mouth above ocean in feet				
Conductor	15	to	15	=
Sandstone	30	"	45	=
Shale	184	"	229	=
Sandstone	40	"	269	=
Shale	431	"	700	=
Sandstone	30	"	730	=
Soft shales	972	"	1702	=

Wet hole. Quite a flow of gas struck at 705′.

There was considerable red rock in the well, but the depth or thickness could not be remembered.

1189. *Shenango Iron Company's Gas Well.*

October, 1875.

On the flat near the furnaces at New Castle, Lawrence county, Pa. Authority, Reis, Brown and Berger.

Well mouth above ocean in feet, approximately				+ 800
Gravel	15	to	15	=
Blue mud and quicksand	125	"	140	=
Slate rock	3	"	143	=
Slate	61	"	204	=
Sand shale	54	"	258	=
Slate rock	54	"	312	=
SS., gray	44	"	356	=
Slate	26	"	382	=
SS., white, salt water and oil	78	"	460	=
Slate	35	"	495	=
Red rock	70	"	565	=

Slate	151	to	716	=
SS	43	"	759	=
Slate	70	"	829	=
Sand shales	30	"	859	=
Slate	75	"	934	=
SS., gray	31	"	965	=
Red rock	3	"	968	=
Slate	19	"	987	=
Slate	207	"	1194	=
Shales, hard	21	"	1215	=
Slate, hard	155	"	1370	=
Sand shales	47	"	1417	=
Slate, hard	68	"	1485	=
SS., gray	50	"	1535	=
Slate	154	"	1689	=
SS., gray	8	"	1697	=
Slate	64	"	1761	=
SS., gray	15	"	1776	=
Slate	69	"	1845	=
SS., gray	17	"	1862	=
Slate	103	"	1965	=
SS., gray	80	"	2045	=
? about	655	"	2700	=

Drive pipe, 143–7.12′. Cased with 5⅝″ casing at 468′.

Gas at 313′, 617,′ 657′ and 717′.

Salt water and oil show at 395′.

This oil is of 32° gravity, dark, and very much like the Franklin oil. It comes to the surface with the salt water which flows constantly between the casing and drive pipe, but there is not a sufficient yield to pay for the trouble of collecting it. It is supposed to come in at, or near, the horizon of the salt water. When this well was completed there was a considerable flow of gas. It was then used to light one of the shops. The yield at present is very small.

This well was first drilled to 1,965′, but was afterwards sunk to 2,700′. From 1,965′ to 2,700′ there was no apparent change in the rocks, which consisted mainly of hard, dark slates, with occasional sand shells.

1190. *Laughlin Well.*

1870. (?)

On Scrubgrass creek, Pine township, Armstrong county. Authority, F. B. and A. Laughlin.

Well mouth above ocean in feet				
? (Interval unknown)	175	to	175	=
SS. (Sandstone) white and fine, estimated	30	"	205	=
Slate, dark and soft	20	"	225	=
Slate, dark, with coal seam	10	"	235	=
Slate, dark and sandy	30	"	265	=
SS., gray and hard, estimated	20	"	285	=
?	82	"	367	=
Red rock	3	"	370	=
Slate	2	"	372	=
SS., blue	87	"	459	=
Slate (?)	76	"	535	=
Red rock	4	"	539	=
Slate, blue and sandy	35	"	574	=
SS., top blue, bottom coarse	26	"	600	=
Slate (?)	25	"	625	=
SS., fine	15	"	640	=
Slate, sandy	20	"	660	=
SS., fine	13	"	673	=
SS. and slate, shells	117	"	790	=
SS	15	"	805	=
?	200	"	1005	=
SS., with large pebbles, estimated	10	"	1015	=
?	395	"	1410	=

Wet hole. Crevice at 96′. Salt water at 295′ and 335′. Gas at 462′, ("heavy flow,") 481′, 590′, and heavy again at 1,010′. Oil show at 805′ and 864′. Show of heavy gravity oil at 1,220′, and green oil at 1,405′. Mouth of well at 20′ below Ferriferous limestone.

1191. *Leechburg Gas Well.*

July 3, 1871.

On the Kiskiminetis river, in Westmoreland county, opposite the town of Leechburg. Well mouth about 15′ below the level of W. Penn railway depot. Authority, Joseph G. Beale.

Well mouth above ocean in feet				
Conductor	22	to	22	=
Sandrock	50	"	72	=
Limestone, with gas and water	6	"	78	=
Fire clay	12	"	90	=

Soft loose shale	200	to	290	=
Blue pebble	60	"	350	=
SS., white	15	"	365	=
Pebbl[illegible]dark	12	"	377	=
Soapstone	18	"	395	=
Blue rock	5	"	400	=
Red rock	8	"	408	=
Slate, dark.	35	"	443	=
SS., white, with little salt water	75	"	518	=
Slate, blue	60	"	578	=
Soft blue rock	100	"	678	=
SS., gray	20	"	698	=
Soapstone	100	"	798	=
Rock, soft and changeable, with salt water	152	"	950	=
SS., white	30	"	980	=
Shale	200	"	1180	=
Blue rock, hard shells	20	"	1200	=
Pebble and sandrock mixed; present gas vein,	30	"	1230	=
Blue rock, hard shells	20	"	1250	=
Depth of well			1250	=

1192. *H. M'Clintock Well.*

1875-6.

At Manchester, near Pittsburg. Authority, Dr. W. G. Hunter.

Well mouth above ocean in feet

Drift	70	to	70	=
SS (Sandstone)	122	"	192	=
Coal slate	4	"	196	=
Slate	24	"	220	=
SS	160	"	380	=
Slate, black	20	"	400	=
SS	70	"	470	=
Slate, black	30	"	500	=
SS	84	"	584	—
SS. and slate	16	"	600	=
Shale and shells	30	"	630	=
Slate	126	"	756	=
SS., shell	4	"	760	=
Slate, shell	4	"	764	=
SS	40	"	804	=
Slate and shells	28	"	832	=
Mt. SS	144	"	976	=
Slate	4	"	980	—
SS	70	"	1050	=
Slate	46	"	1096	=
SS	14	"	1110	=
Slate shells	18	"	1128	=
SS	38	"	1166	=

SS. and slate, black	220	to	1386	=
1st oil SS.	134	"	1520	=

Heavy flow of salt water at about 1,400′. No oil.

1193. *Rochester Tumbler Co.'s Well, No.* 1.

Commenced in 1874 and finished in 1876.

Located near the river bank at Rochester, Beaver county. Authority, Mr. Cain, manager; from memory.

Well mouth above ocean in feet				
Conductor, gravel	30	to	30	=
SS. (Sandstone) estimated	50	"	80	=
? (Interval unknown) estimated	200	"	280	=
Coal, slaty	2	"	282	=
?	118	"	400	=
SS	110	"	510	=
?	290	"	800	=
SS	50	"	850	=
?	50	"	900	=
SS., ("Mt. SS., soft") gas and oil at 920′)	40	"	940	=
?	25	"	965	=

Five and a half inch hole. Drilled wet. Cased at 830′ with 3¼″ casing.

Salt water before 300′. Heavy vein of salt water between 820′ and 840′.

Slaty coal in streaks of 10″ between 350′ and 400.

[This well was put down by contract to the depth of 300′ in 1874, and drilled deeper from time to time by the men employed about the glass works, as opportunity offered; consequently the record was very imperfectly kept originally, and even this partial account of the drilling was destroyed by fire, so that nothing remains now but the general recollection of it as given above.

The well flowed at first about 1,000 barrels of salt water per day, with a very little oil, occasionally throwing it above the top of the derrick. The water could not be exhausted by pumping, and as it flowed constantly the tubing was drawn and the stream turned into a covered tank. Here the gas collects and is conveyed by pipes to the glass works, while the water is let off at the bottom.

There was sufficient gas at first to fire 7 "glory holes" and run the annealing furnaces which had before required 140 bushels of coal and 100 bushels of coke per day.

The well is flowing now (January, 1877,) about 15 barrels of very salt water, with half a barrel of oil per day, and the volume of gas has also very perceptibly decreased.

The glass manufactured by the gas furnaces was so superior in quality to that made by coal, the expense so much less and the convenience of its use so desirable that the company were induced to put down another well to increase their gas. This well was also sunk by contract, and no reliable record has been kept, but the drilling is said to have agreed very closely with No. 1. Salt water, oil and gas were encountered the same as in No. 1 at a depth of about 920′, and the drilling was continued down to 1,200′ without any further increase. The character of the rocks below 930′ is given as follows:

Shales, no red rock	105	to	1035	=
Gray sandstone, about	30	"	1065	=
Slate, with some red rock	135	"	1200	=

Well No. 2 is flowing a large amount of salt water, bearing with it considerable oil, amounting, perhaps, to three or four barrels per day. An effort is now being made to ream out the hole with a view of introduciug large casing to shut out the water so that the gas and oil may have free vent. The supposition is that the salt water comes into the well independently of the gas and at a higher level. If this be so, no doubt the well will be greatly improved by the operation.]

1194. *M'Laughlin & Hayes Well.*

September, 1876.

Two and a half miles north-west of Pleasant Unity, Westmoreland county. Authority, Andrew Zuver.

Well mouth above ocean in feet				
Conductor	11	to	11	=
Limestone	3	"	14	=
"Horseback"	5	"	19	=
Red clay and dark slate alternating	309	"	328	=
1st SS. (First Sandstone)	16	"	344	=
Slate	62	"	406	=
"Black Diamond slate"	10	"	416	=

Shale	24	to	440	=
2d SS	75	"	515	=
?	81	"	596	=
Stray 3d SS	12	"	608	=
SS., gray	12	"	620	=
SS., white	25	"	645	=
? pocket,	5	"	650	=

No red below 1st SS. Unproductive.

1195. *Burrell Oil Company's Well.*

1861.

Smith's Ferry. Copied from a record made by W. H. Uncapher, "well borer."

Well mouth above ocean in feet				
Conductor	4	to	4	=
SS. (Sandstone) "glass rock," white	10	"	14	=
Slate, black	4	"	18	=
Gray rock	1	"	19	=
Slate, black	2	"	21	=
Fire clay	4	"	25	=
Gray rock	4	"	29	=
White rock	21	"	50	=
Black rock	15	"	65	=
Slate and fire clay	5	"	70	=
Slate, black, gas	6	"	76	=
Slate, porous, gas and oil	7	"	83	=
Coal	7	"	90	=
Slate and fire clay	10	"	100	=
Slate and limestone	10	"	110	=
2d SS	15	"	125	=
Gray rock	31	"	156	=
SS., white	37	"	193	=
Slate or shale, black	13	"	206	=
SS., fine	19	"	225	=
Slate	49	"	274	=
Hard white rock	6	"	280	=
SS., fine and gray	10	"	290	=
Slate	2	"	292	=
Hard rock and slaty rock	8	"	300	=
Slate	17	"	317	=
Hard white rock	6	"	323	=
Gray slaty rock	26	"	349	=
Slate	14	"	363	=
SS., hard	2	"	365	=
Slate	15	"	380	=
SS	15	"	395	=
Slate	28	"	423	=
SS	5	"	428	=
Slate	2	"	430	=

SS., gas and salt water	**43**	**to**	**473**	=
Hard rock	**7**	**"**	**480**	=
SS., fine	**20**	**"**	**500**	=

Unproductive; not having been drilled deep enough to reach the main oil bearing rock of this section.

1196. *Well on Yellow Creek.*

1872.

Near Moore's salt works, Saline township, Jefferson county Ohio. Authority, Jesse Johnson.

Well mouth above ocean in feet				
Conductor	**24**	**to**	**24**	=
? (Interval unknown)	**76**	**"**	**100**	=
Coal	**5**	**"**	**105**	=
Fire clay	**10**	**"**	**115**	=
Slate (salt water and gas at 170')	**131**	**"**	**246**	=
Flint, black	**4**	**"**	**250**	=
Slate	**33**	**"**	**283**	=
Flint, blue	**4**	**"**	**287**	=
Slate (salt water at 413')	**132**	**"**	**419**	=
1st white SS	**17**	**"**	**436**	=
Pebble rock	**64**	**"**	**500**	=
Slate	**8**	**"**	**508**	=
SS., white, (tested here)	27	"	535	=
Slate, shells and pebbles	355	"	890	=
2d SS., (gas and oil at 930') tested here	50	"	940	=
Slate and shells	72	"	1012	=
Red Rock and shells	40	"	1052	=
Red rock	48	"	1100	=
Close shell	2	"	1102	=
Red rock	3	"	1105	=

Drilled dry. Unproductive.

1197. *Swift Farm Well.*

Brounhelm township, Loraine county, Ohio. Authority, S. Minor.

Well mouth above ocean in feet				
Slate rock	450	to	450	=
Soapstone	85	"	535	=
Limestone	50	"	585	=
Sandstone	22	"	607	=
Flint	15	"	622	=
Sandstone	13	"	635	=

Good show of oil in the last sandrock.

1198. *Yankee Well.*

April, 1866.

Town creek, Lawrence county, Alabama. Authority, Jas. Pettigrew.

Well mouth above ocean in feet				
Limestone, rotten	10	to	10	=
Soapstone	14	"	24	=
Sandstone, gray and white	24	"	48	=
Sandstone streaks	24	"	72	=
Sandstone, lime and flint	48	"	120	=
Soapstone	164	"	284	=
Limestone, hard	63	"	347	=
Lime and flint	12	"	359	=
Sandstone, light gray	6	"	365	=
Lime and flint	23	"	388	=
Sandstone (crevice and smell of oil)	9	"	397	=
Limestone, hard	59	"	456	=
Flint, hard	59	"	515	=

Wet hole 4¾″ in diameter. At 515′ struck a sandstone, broke the jars and abandoned the well.

CHAPTER XXIV.

Special Record of Six Wells Near Petrolia.

The following records of six wells near Petrolia, in Butler county, were selected for special measurement during the time of drilling in the winter of 1876-77. The work was assigned to Mr. John H. Carll, special assistant, who was provided with reels and tapes for the purpose; as will be described in the forthcoming Report of Progress I.I.I., by Mr. John F. Carll, 1877.

They are arranged on pp. 284 to 296 in such a way as to make reference from one to another easy; and the names given to the key-rocks—coals, limestones, and sand-rocks—are printed in bold-face type for the same reason. For the geological discussion of the propriety of these names the reader is referred to that report.

1199. *Sutton Well No.* 4.

January 5, 1877.

Owned by H. L. Taylor & Co., and situated on the P. Sutton Farm, Fairview township, Butler county, about 2¼ miles south 70° west of Petrolia.

Well mouth above ocean in feet						1436
Conductor		9	to	9	=	1427
Slate	alternating with sand shells, bluish,	133	"	142	=	1294
SS	dark gray,	24	"	166	=	1270
Slate and shale		6	"	172	=	1264
Coal	**Coal**	1	"	173	=	1263
Slate and shale	dark gray,	49	"	222	=	1214
Limestone	**Limestone**	—	"	222	=	1214
Slate	dark gray,	34	"	256	=	1180
SS	gray,	16	"	272	=	1164
Slate, shale and sandy shells	dark,	125	"	397	=	1039
Limestone	**Ferrif. Limestone**	20	"	417	=	1019
Slate and sand shells with some iron pyrites and trace of coal	dark,	32	"	449	=	987
SS	top white, bottom black, "60' rock,"	43	"	492	=	944
Slate and shale	bluish gray, black at bottom,	45	"	537	=	899
SS	grayish white, "20' rock,"	18	"	555	=	881
Slate and shale	shelly, dark,	52	"	607	=	829
SS.......... white, 30' SS.......... grey, 20' SS...white and soft, 50' SS., white and close, 40' SS., white and soft, 43'	**"Mountain Sand"**	183	to	790	=	646
Slate, shale and sand shells	dark on top, black on bottom,	145	"	935	=	501
SS	hard and white,	5	"	940	—	496
Slate	clean, bluish-gray,	30	"	970	=	466
SS	shaly, gray,	20	"	990	=	446
Shale	slaty, bluish-gray, with a gas vein at 1,190' in a thin shell of fine bluish SS.,	260	"	1250	=	186
Shale	sandy, with a few yellow pebbles, bluish,	52	"	1302	=	134
Slate	shaly, purplish,	34	"	1336	=	100

SS	pebbly,	3'	"**Second Sand**"	36	" 1372	= 64
SS	gray,	9'				
SS	slaty mixture,	12'				
SS	gray and fine,	12'				
Slate and shale	dark,			38	" 1410	= 26
SS	uniform, hard, white, "50 rock,"			22	" 1432	= + 4
Slate	blue,			28	" 1460	= — 24
SS	homogeneous, fine, white, "30' rock,"			42	" 1502	= — 66
Slate	shelly, blue,			8	" 1510	= — 74
SS	yellowish-gray, fine "Boulder,"			14	" 1524	= — 88
Slate	blue,			6	" 1530	= — 94
SS	gray, "stray 3d,"			16	" 1546	= — 110
SS	pebbly,		"**Third Sand**"	20	" 1566	= — 130
SS	white,					
SS	gray and hard,					
Slate	shaly, dark blue,			40	" 1606	= — 170
SS	dark "clover seed" pebble,		(not through) "**Fourth Sand**"	25	" 1631	= — 195
SS	fine, white,					
SS	good white pebble,					

Drilled dry. Cased at 643'. A very little salt water below the casing.

Gas at 1,190', half sufficient to fire the boiler with while drilling, but this gas was exhausted in three or four days. About the same amount of gas was found in the "2d sand."

Very little oil in the "3d sand." The hole filled up 300' or 400' with oil from the top of the "4th sand," and flowed when drilled a few feet deeper. No Red Rock found in drilling. Best daily production, 40 barrels.

1200. *Dougherty Well, No. 2.*

December 7, 1876.

Owned by Dougherty and Devlin, and situated on the M'Cleary farm, Fairview township, Butler county, about 1 mile south 80° west of Petrolia, and 1¼ miles north 60° east from Sutton Well, No. 4.

Well mouth above ocean in feet							1327
Conductor			10	to	10	=	1317
SS		surface, yellow,	5	"	15	=	1312
Slate		bluish,	55	"	70	=	1257
Limestone	**Limestone**	thickness unknown,	—	"	70	=	1257
Slate		sandy; top blue, bottom gray and muddy,	85	"	155	=	1172
SS		gray,	51	"	206	=	1121
Coal	**Coal**	slaty,	3	"	209	=	1118
Sand shells		hard and blue,	10	"	219	=	1108
Slate		dark,	21	"	240	=	1087
Limestone	**Ferriferous Limestone**		20	"	260	=	1067
Slate		soft, dark,	20	"	280	=	1047
SS		gritty, white, "sixty-foot rock,"	80	"	360	=	967
Slate		very dark,	30	"	390	=	937
Shale		sandy, dark gray,	50	"	440	=	887
SS		hard, white, with layers of black slate, "twenty-foot rock,"	24	"	464	=	863
Slate		black,	8	"	472	=	855
SS		soft and gray on top, hard and white on bottom,	83	"	555	=	772
Slate		dark, with gray sand shells,	27	"	582	=	745
SS... { top, fine yellow bottom, soft and gray, }	**"Mountain Sand"**		93	"	675	=	652
Slate		shelly, bluish,	17	"	692	=	635
Slate and gray sand shells			108	"	800	=	527
Slate		bluish,	125	"	925	=	402
Sand shells		gray,	15	"	940	=	387
Slate		bluish,	100	"	1040	=	287
Slate		purplish,	80	"	1120	=	207
Slate		bluish,	58	"	1178	=	149

SS.... hard and bluish gray,	12′	"**Second Sand**" and "fifty-foot rock,"	87	" 1265	= 62
SS.......... olive and gray,	20′				
SS.................... slaty,	45′				
SS............... fine gray,	10′				
Red rock			1	" 1266	= 61
Sand shells and slate		"thirty-foot rock,"	48	" 1314	= + 13
SS.		hard and white on top, yellowish-gray on bottom, "Blue Monday,"	16	" 1330	= − 3
Red rock.		"Big Red Rock,"	12	" 1342	= − 15
Slate		bluish,	21	" 1363	= − 36
SS		very fine and light gray, "boulder,"	10	" 1373	= − 46
Slate.		dark,	12	" 1385	= − 58
SS., fine, white		"**Stray Third**"	27	" 1412	= − 85
Slate.		dark,	8	" 1420	= − 93
SS. (about through)		pebbly and white on top, fine and yellowish-gray at bottom,	16	" 1436	= − 109

Drilled dry. Cased the first time at 478′. Flood of salt water at 570′. Casing pulled and put in the second time to a depth of 610′, and found no water below this depth. A small amount of gas in the "2d sand." Oil in the "3d sand," at 1,423′. Average daily production, 15 barrels.

1201. *Evans Well, No.* 21.

December 23, 1876.

Owned by Evans & Co., and situated on the Dougherty farm, Fairview township, Butler county, about four-fifths of a mile south 40° west of Petrolia and about three-fourths of a mile south 40° east of the Dougherty Well, No. 2.

Well mouth above ocean in feet							1393
Conductor			18	to	18	=	1375
Slate and shale, with bluish-gray shells			162	"	180	=	1213
Limestone	**Limestone**	thickness unknown,	—	"	180	=	1213
SS		very fine, dark,	45	"	225	=	1168
Shelly shale		gray,	64	"	289	=	1104
Coal	**Coal**		1	"	290	=	1103
SS		very muddy, fine, gray,	4	"	294	=	1099
Slate and shells		gray, muddy,	43	"	337	=	1056
Limestone	**Ferriferous Limestone**		21	"	358	=	1035
Slate		very dark,	18	"	376	=	1017
Coal	**Coal**		4	"	380	=	1013
Slate		very dark,	6	"	386	=	1007
SS		"sixty-foot rock," top gray and close, bottom fine and dark,	66	"	452	=	941
Slate		dark,	44	"	496	=	897
Slate, with dark sand shells			50	"	546	=	847
SS		gray,	5	"	551	=	842
Slate		sandy, dark,	35	"	586	=	807
SS		white, with trace of coal,	2	"	588	=	805
Slate		sandy, dark,	9	"	597	=	796
SS. gray occasional partings of dark slate	**"Mountain Sand"**		148	"	745	=	648
Slate		fawn-color and bluish,	20	"	765	=	628
Sand shells		gray, with partings of slate and shale,	80	"	845	=	548
SS		flaggy, olive-gray,	50	"	895	=	498
SS		white,	35	"	930	=	463
Slate		sandy, dark,	70	"	1000	=	393
Slate		more shelly, dark gray,	100	"	1100	=	293
Slate		muddy, dark,	100	"	1200	=	193
Slate		sandy, dark,	74	"	1274	=	119

SS., fine, olive-gray	“**Second Sand**”	17	“ 1291	= 102
Slate dark		3	“ 1294	= 99
SS. fine, with slate partings	olive-gray, “fifty-foot rock,”	54	“ 1348	= 45
Red rock	sandy, “thirty-foot rock,”	13	“ 1361	= + 32
Slate	dark, with gray sand shells,	36	“ 1397	= — 4
SS	hard, bluish-gray, “Blue Monday,”	6	“ 1403	= — 10
Red rock	hard slate,	27	“ 1430	= — 37
Slate	dark,	29	“ 1459	= — 66
SS	hard, olive-gray, “boulder,”	10	“ 1469	= — 76
Slate	dark,	12	“ 1481	= — 88
SS., white	“**Stray Third**”	25	“ 1506	= — 113
Slate	dark,	7	“ 1513	= — 120
SS., pebbly, coarse, gray	“ **Third Sand**,	15	“ 1528	= — 135
Slate, shelly, purplish	trace of red rock at 1,565′,	58	“ 1586	= — 193
SS., pebbly, coarse, white	“**Fourth Sand**,”	22	“ 1608	= — 215
Slate	very dark,	8	“ 1616	= — 223

Drilled dry. Cased at 705′, and found no water below casing. A little gas at 1,120′. Oil at 1,519′, and no increase of oil in the “4th sand.” Torpedoed, but no apparent increase of oil. Pumped about 1½ barrels of oil per day. Torpedoed a second time, and after that said to be averaging 10 barrels per day.

1202. *Hazelwood Well No. 21.*

December 7, 1876.

Owned by the Hazelwood Oil Company, and situated on the H. P. Shakely Farm, Fairview township, Butler county, about one-half mile south 35° east of Petrolia, and four-fifths of a mile north 75° east of Evans Well No. 21.

Well mouth above ocean in feet						1298
Conductor		16	to	16	=	1282
Shells	soft, shaly, grey, muddy,	110	"	126	=	1172
Shells	slaty, grey,	30	"	156	=	1142
Slate	hard, sandy, bluish-grey,	44	"	200	=	1098
Coal	**Coal**	1	"	201	—	1097
Slate	grey and muddy,	44	"	245	=	1053
Limestone	**Ferriferous Limestone**	20	"	265	=	1033
Slate	dark,	30	"	295	=	1003
Coal	**Coal**	2	"	297	=	1001
SS.	grey, "60' rock,"	30	"	327	=	971
Slate	dark,	36	"	363	=	935
SS	grey and brownish grey,	52	"	415	=	883
Slate	with grey shells,	40	"	455	=	843
Slate	very dark,	29	"	484	=	814
SS soft, bluish-grey, 70'	**"Mountain Sand"**	186	"	670	=	628
SS hard, white, 50'						
SS gritty olive grey, 30'						
SS. shelly, with dark slate, 36'						
Slate	dark,	100	"	770	=	528
Slate	sandy and hard,	37	"	807	=	491
SS., fine and hard	top grey, bottom very dark,	28	"	835	=	463
Slate	bluish,	100	"	935	=	363
Slate	shelly,	90	"	1025	=	273
SS.	dark grey,	10	"	1035	=	263
Slate	sandy, dark,	50	"	1085	=	213
Slate	dark,	70	"	1155	=	143
Slate	purplish,	52	"	1207	=	91

SS	**"Second Sand"**	olive grey,	6	"	1218	=		85
Red rock sandy		chocolate color,	4	"	1217	=		81
SS., olive grey, flakey		"50 and 30 rocks,"	63	'	1280	=	+	18
Slate		sandy, dark,	32	'	1312	=	—	14
SS.		fine, dark gray, "Blue Monday,"	6	to	1318	=	—	20
Red rock		soft, "Big Red Rock,"	18	"	1336	=	—	38
Slate		dark,	20	"	1356	=	—	58
SS		grey, "Boulder,"	3	"	1359	=	—	61
Slate		bluish,	23	"	1382	=	—	84
SS., with yellow pebbles	**"Stray Third"**		29	"	1411	=	—	113
Slate		dark,	1	"	1412	=	—	114
SS., coarse and grey	**"Third Sand"**		19	"	1431	=	—	133
Slate		dark,	19	"	1450	=	—	152
Red rock			8	"	1458	=	—	160
Slate		purplish,	24	"	1482	=	—	184
SS., yellowish-grey	**"Fourth Sand"**	very fine at bottom,	27	"	1509	=	—	211
Slate		very dark,	3	"	1512	=	—	214

Drilled dry. Cased at 486'. A little salt water in the "Mountain sand," below the casing, about half enough to drill with. Very little gas in the "2d sand." Oil in the "3d sand" at 1,415, and no increase in the "4th." Torpedoed before being tubed with no apparent increase of oil. Average daily production, 15 barrels.

1203. *Morehead and Lardin Well, No. 2.*

January 6, 1877.

Owned by Morehead, Lardin & Co., and situated on the Mortimer farm, Fairview township, Butler county, about four-fifths of a mile east of Petrolia, and three-fourths of a mile north 55° east of Hazelwood Well, No. 21.

Well mouth above ocean in feet						1420
Conductor		5	to	5	=	1415
Slate, muddy, trace of **Limestone and Coal**	reported at about 70',	105	"	110	=	1310
SS	gray, trace of coal at the bottom,	125	"	235	=	1185
Slate	black,	25	"	260	=	1160
Shelly gray sand and very black slate	interstratified,	68	"	328	=	1092
Limestone **Ferriferous Limestone**		18	"	346	=	1074
Slate	very dark,	20	"	366	=	1054
Slate	muddy, bluish-gray,	21	"	387	=	1033
SS	gray, "sixty-foot rock,"	48	"	435	=	985
Slate, with blue sand shells		37	"	472	=	948
SS	white, with trace of coal,	20	"	492	=	928
SS	gray, with slate partings,	28	"	520	—	900
Slate	black, with gray sand shells,	31	"	551	=	869
SS.... hard, gray, with films of coal, 20' SS ..... fine, grayish-white, 90' SS ..... coarse, white, 69'	**"Mountain Sand"**	179	"	730	=	690
Slate	common,	30	"	760	=	660
SS..... flaky, gray, micaceous, 30' SS ..... muddy, gray, 100' SS ..... fine, muddy, gray, 76'	good drilling,	206	"	966	=	454
Slate	muddy, bluish,	75	"	1041	=	379
Shells	bluish,	10	"	1051	=	369
Slate	dark,	100	"	1151	=	269
Slate	with thin sand shells,	35	"	1186	=	234
Slate	gritty, dark,	94	"	1280	=	140

SS., with slate partings, muddy, olive-gray, "**Second Sand**"	38	" 1318 =	108
Red rock.................. trace,	—	" 1318 =	108
Slate.................. with thin sand shells, dark,	65	" 1383 =	37
SS.................. slaty, olive and red, "thirty-foot rock,"	15	" 1398 =	22
Slate.................. blue,	34	" 1432 = —	12
SS.................. fine, and ashy gray, "Blue Monday,"	10	" 1442 = —	22
Red slate.................. "Big Red,"	24	" 1466 = —	46
Slate.................. dark,	27	" 1493 = —	73
SS.................. shelly, "boulder,"	4	" 1497 = —	77
Slate.................. dark,	3	" 1500 = —	80
SS., top greenish, middle yellowish........ "**Stray Third**" .... bottom coarse and white,	18	" 1518 = —	98
Slate.................. dark,	10	" 1528 = —	108
SS., (1) large white pebbles, (2) very fine gray sand, (3) very fine white sand, (4) very fine gray sand, "3d sand," (not through) ...... "**Third Sand**"	21	" 1549 = —	129

Drilled dry. Cased at 526′ and no water found below the casing. A little gas in the "2d sand." Oil in the "3d sand" at 1,530′; flowed at 1,545′. Average daily production, 12 barrels.

1204. *Kern Well, No.* 6.

November 27, 1876.

Owned by H. L. Taylor & Co., and situated on the W. Snow farm, Fairview township, Butler county, about 1¾ miles south 85° east of Petrolia, and ½ miles south 80° east of the Morehead & Lardin Well, No. 2.

Well mouth above ocean in feet							1464
Conductor			10	to	10	=	1454
Slate and sand with some	**Coal**		192	“	202	=	1262
Limestone	**Limestone**	with a crevice sinking the water,	?	“	202	=	1202
Slate		shelly, working up into “mud balls,”	93	“	295	=	1169
SS		fine, light green,	50	“	345	=	1119
Shale		soft and muddy,	38	“	383	=	1081
Limestone	**Ferr. Limestone**		21	“	404	=	1060
Slate and mud		purplish,	16	“	420	=	1044
Shells and slate		hard, black and gray, trace of coal on top,	80	“	500	=	964
Slate		shelly, very dark,	86	“	586	=	878
SS. { Top flaky, Bottom muddy, gray and white, }	**Mountain Sand**		81	“	667	=	797
Slate		dark gray,	30	“	697	=	767
SS		fine and hard, grayish-white,	112	“	809	=	655
Slate		dark, bottom shelly, trace of red at 870′,	71	“	880	=	584
SS		gray, large percentage of dark slate,	112	“	992	=	472
Slate and shale, with thin shells		dark gray, muddy,	148	“	1140	=	324
Shells		hard and gray,	10	“	1150	=	314
Slate, with shells, dark gray		trace of red and a few yellow pebbles at 1194′,	110	“	1260	=	204
Slate		soft and muddy, lead color,	77	“	1337	=	127

SS., grayish-white	**Second Sand**	5	' 1342 =	122
Slate		6	" 1348 =	116
Red rock	"Big Red Rock,"	17	" 1365 =	99
Slate and shale	soft,	53	" 1418 =	46
SS	slaty, gray,	14	" 1432 =	32
Red rock		8	" 1440 =	+ 24
Slate	dark,	40	" 1480 =	— 16
Sandy shale		15	" 1495 =	— 31
Red rock		3	" 1498 =	— 34
Sandy shale		17	" 1515 =	— 51
Red rock		2	" 1517 =	— 53
Shale	dark olive-gray,	23	" 1540 =	— 76
Red rock		5	" 1545 =	— 81
Shale	dark olive-gray,	15	" 1560 =	— 96
SS	pebbly, black, "boulder,"	5	" 1565 =	— 101
Slate	dark gray,	4	" 1569 =	— 105
SS., top pebbly, white, bottom fine sand, **Third Sand**		28	" 1597 =	— 133
Slate	bluish,	13	" 1610 =	— 146

Drilled dry. Cased at 617′, and no water found below the casing. A little gas at 1138′, and show of oil. Oil in the "3d sand" at 1,570′. Average daily production, 12 barrels.

CHAPTER XXV.

OIL WELL ELEVATIONS IN CLARION, ARMSTRONG AND BUTLER COUNTIES.

The following elevations of well mouths in the counties of Clarion, Armstrong and Butler, have been compiled by Mr. H. M. Chance, partly from his own field notes of 1876 and partly from Mr. F. A. Hatch's notes of 1875. These levels were all provisionally recorded at the time they were taken, some being based on the Parker and Karns City RR. datum, some on Mr. D. Jones Lucas' Union Pipe Co. datum and others on the Brady's Bend datum. They had not been adjusted to true ocean level, nor could they be so adjusted, on account of the uncertainty surrounding the levels of the Allegheny Valley RR., on which they were dependent for a connection with tide water. This difficulty was only removed in March last by our re-leveling of a part of the Valley road, and then it was ascertained that all our provisional elevations were too high. They varied, also, from 6′ to 22′, according to the datum planes used. It would not be surprising, therefore, if some slight clerical errors have been made in preparing this table for publication, for the levels were all based on these disagreeing datum planes, and have been selected from field notes made at wide intervals and by different parties.

Our plan has been, in leveling through a closely drilled district, to keep the direct line of levels with a great deal of care, while the numerous side wells are taken more rapidly and with less caution, and the notes used in such a manner as not to affect the integrity of the main line in case an error of a few inches should be made on any particular side well. The variation of a foot, or even more, in the actual levels between two wells is practically of no account in a study of their records, for be the levels to the well mouths ever so precise we are still dependent on the drillers' measurement of the bore hole, where an error is quite likely to occur, for the most important elements in our calculations.

But while the plan adopted secured good results along the main line, which was found to run through with very gratifying accuracy from Parkers to Great Belt City, it is still open to an opportunity for slight disagreements, which, although really of no importance, may make some of the levels appear to lack that strict consistency and relative agreement which are regarded as the proofs of accurate instrumental work. Transverse lines must necessarily be run, and these may be for convenience, or thoughtlessly, based by one party on some one of the secondary wells of another party, and the possibility of error may be augmented, perhaps, by taking the casing head as the level point where the derrick floor was previously used, or *vice versa.* Thus disagreements appear which are not due to instrumental inaccuracies, but to a misunderstanding of hasty or meagre notes.

Another difficulty encountered by every engineer who has undertaken this kind of work, is to obtain the names of the wells and their locations so that they can at all times thereafter be identified by himself and others. He may learn that this is Smith well No. 1, farm unknown. It is perhaps the only well in the vicinity at the time, and the name seems definite enough. But a few months later some one attempts to connect his levels with Smith No. 1, and he finds that Mr. Smith has a lease on the Jenkins farm and another adjoining on the Jones farm.

There is now a Smith No. 1 on each lease, and which is the well referred to no one can tell to a certainty, but the probabilities are he will be directed to the wrong one, and a disagreement of levels is the result. Then, too, the pumpers frequently have one name for a well while the owners have another, and the name is changed as often as the ownership of the well changes.

But notwithstanding the drawbacks mentioned, the publication of these well elevations cannot but be of great service to a large class of oil operators. They give a general idea of the topography of the country, and afford the means of approximate comparisons of levels both of surface and oil sands to those who are acquainted with the localities and the histories of the wells, which could not be obtained in any other way.

GROUP I.

Wells in the Vicinity of Parker.

	Name.	Locality.	Township.	Elevation ab. ocean
1205	**J. E. Brown**	**Parker City**	**Perry, Armstrong co.**	**879**
1206	**Clearfield**	**Lawrenceburg**		**1096**
1207	**Maggie**	**Farrentown**	**do**	**1140**
1208	**Parsons**	**do**	**do**	**1036**
1209	**Armstead**	**do**	**do**	**1140**
1210	**Sulphur Water Well**	**Thoms run**	**do**	**942**
1211	**Lioness**	**Duchess Farm**	**Allegheny, Butler co.**	**1066**
1212	Divide or "Vide"	do do		**1104**
1213	Forker, No. 1	do do	do	**1097**
1214	Critchlow	do do	do	**1097**
1215	Marion	Robinson Farm	do	**1161**
1216	Dull	do do	do	**1174**
1217	Clifford	do do	do	**1171**
1218	Game	do do	do	**1104**
1219	Darling		do	**1102**
1220	Well	Columbia Hill	do	**1452**
1221	Do	do do	do	**1460**
1222	Do	do do	do	**1465**
1223	Do	do do	do	**1471**
1224	Do	do do	do	**1464**
1225	Columbia, No. 3	Reddick Farm	do	**1490**
1226	do No. 2	do do	do	**1479**
1227	Hoopskirt, No. 1	Robinson (?) Farm	do	**1311**
1228	do No. 4	do do	do	**1379**
1229	Tycoon	do do	do	**1332**
1230	Booth	do do	do	**1319**
1231	Exchango	do do	do	**1235**
1232	Mystic	Robinson or Duchess	do	**1236**
1233	Maple Shade	do do	do	**1290**
1234	South Side	do do	do	**1319**
1235	Well	Black Farm	do	**1223**
1236	Do	do do	do	**1182**
1237	Do	do do	do	**1184**
1238	Do	do do	do	**1171**

GROUP 2.

Wells at Stonehouse.

	Name.	Locality.	Township.	Elevation ab. ocean ......
1239	Ed. Bennett, No. 1...	Stonehouse Tract.........	Parker, But-	1015
1240	....do.........No. 2...	....do........do...........	ler co	1007
1241	Butler, No. 1	....do........do...........	.....do.....	1005
1242	Well...........	Person's(?)F., N. Bear cr.	.....do......	1149

GROUP 3.

Wells Near Martinsburg, Campbell and Argyle.

	Name.	Locality.	Township.	Elevation ab. ocean ......
1243	Hart & Hicks, No. 1..	H. H. Say Farm..........	Parker, But-	1289
1244	..do......do....No. 2..	....do........do...........	ler co.....	1371
1245	..do......do....No. –..	....do........do...........	.....do......	1407
1246	Cornwall, No. 1	Near Martinsburg........	.....do......	1319
1247	Jacobs................	Sedgwick Farm	.....do......	1156
1248	Billy Patterson.......	Fronsinger Farm..........	.....do......	1382
1249	Jenkins	Say (?) Farm.............	.....do......	1132
1250	Rattling Jack.........	..do......do................	.....do......	1183
1251	Brawley, No. 1........	Fletcher Farm	.....do......	1127
1252	Arrowsmith	....do....do...............	.....do......	1129
1253	Bennett, No. 1........	....do....do...............	.....do......	1138
1254	Wildcat, No. 1........	....	.....do......	1135
1255	Harrington, No. 1....	Gibson Farm.............	.....do......	1138
1256	Rebecca Jane	....	.....do.....	1143
1257	Ingleside............	....	.....do......	1146
1258	Rosebud.............	....	Fairview,	1151
1259	Harrop & Co., No. 1 ..	Harrop Farm.............	Butler co.	1149
1260	Emery&Caldwell,No.1	R. D. Campbell Farm....	.....do......	1156
1261	...do........do....No.4	....do.............do.....	.....do......	1160
1262	Robt. Campbell	....do.............do.....	.....do......	1157
1263	Argyle...............	A. L. Campbell Farm....	.....do......	1163
1264	Satterfield & Taylor..	....do.............do.....	.....do......	1162
1265	Bly & Rowley, No. 2..	....do.............do.....	.....do......	1171
1266	Good Enough, No. 1..	....do.............do.....	.....do......	1164
1267	..do......do....No. 2..	....do.............do.....	.....do......	1171
1268	A. L. Campbell, No. 3.	....do.............do.....	.....do......	1171
1269	..do... ..do.....No. –.	....do.. ....do.....	.....do......	1168
1270	Lady Campbell.......	....	.....do......	1166

GROUP 4.

Wells Near Petrolia and Karns City.

	Name.	Locality.	Township.	Elevation ab. ocean......
1271	Shidemantle..........	Petrolia	Fairview,	1171
1272	Lightfoot	...do	Butler co.	1175
1273	S. N. Delap, No. 1.....	...do	.....do......	1177
1274	Nesbit & Lardin, No.1	J. Blaney Farm	.....do......	1179
1275	...do........do...No.3	......do.....do............	.....do......	1183
1276	...do........do...No.5	......do.....do............	.....do......	1181
1277	Hazlewood Co., No. –.	Blaney or Sheakley Farm	.....do......	1193
1278	....do.......do..No. –.	....do........do ......do..	.....do......	1176
1279	Ralph..................	W. A. Wilson Farm......	.....do......	1190
1280	Spence................	........do........do........	.....do......	1206
1281	Hazelwood, No. 8....	H. P. Sheakley Farm.....	.....do......	1189
1282	......do.....No. 13....	......do...........do......	.....do......	1226
1283	......do.....No. 21....	......do...........do......	.....do......	1223
1284	......do.....No. –....	......do...........do......	.....do......	1202
1285	Sheakley, No. 1.......	......do...........do......	.....do......	1214
1286	Say, No. 1.............	Mrs. Smith Farm.........	.....do......	1185
1287	..do..No. 2.............	....do........do...........	.....do......	1184
1288	Smith & Thompson ...	....do........do...........	.....do......	1206
1289	Perdue, No. 1..........	....do........do...........	.....do......	1192
1290	...do....No. 2..........	....do........do...........	.....do......	1191
1291	Preston Water Well..	....do........do...........	.....do......	1196
1292	Christian & Cameron.	Hazelwood Oil Co. Tract..	.....do......	1210
1293	M'Donald	....do........do.... do....	.....do......	1187
1294	Frothingham, No. 1..	M. Banks Farm	.....do......	1198
1295	Banks, No. 1..........	....do.......do............	.....do......	1196
1296	...do....No. 2..........	....do.......do............	.....do......	1197
1297	Mattison & M'Donald,	M'Clyman's Farm........	.....do......	1244
1298	Rob Roy..............	.....do........do..........	.....do......	1221
1299	M'Clymans, No. 7....	.....do ....do..........	.....do......	1297
1300	Nesbit & Lardin, No.2	Jamieson Farm...........	.....do......	1185
1301	Templeton............	.....do......do............	.....do......	1222
1302	Banks & Gaily........	W. Scott Farm	.....do......	1221
1303	Tack & Morehead, No.1	M'Alear (?) Farm........	.....do......	1233
1304	..do.......do.....No.2	....do.........do..........	.....do......	1229

GROUP 5.

Wells Near Petrolia and Fairview.

	Name.	Locality.	Township.	Elevation ab. ocean......
1305	Jennings, No. 5	Dougherty Farm	Fairview,	1217
1306	Reed	do do	Butler co.	1222
1307	Newton	do do	do	1231
1308	Evans, No. 21	do do	do	1393
1309	Hornet	M'Cleary Farm	do	1284
1310	Spider	do do	do	1264
1311	Dougherty, No. 2	do do	do	1327
1312	Mitchell, No. 2	do do	do	1317
1313	Strickland & Fuller	do do	do	1322
1314	Cleminger & Maxwell	do do	do	1399
1315	Sutton, No. 4	P. Sutton Farm	do	1436
1316	Mary Ann	W. Wilson Farm	do	1288
1317	Lauretta, No. 1	do do	do	1254
1318	Lauretta, No. 2	do do	do	1324
1319	Hope	do do	do	1269
1320	Shanghai	do do	do	1306
1321	Anderson	do do	do	1360
1322	Mayville, No. 2	Mayville Tract	do	1374
1323	Mayville, No. 4 ?	do do	do	1331
1324	Patton, No. 2	Patton Farm	do	1369

GROUP 6.

Wells Near Modoc and Greece City.

	Name.	Locality.	Township.	Elevation ab. ocean......
1325	Down East, No. 1	D. C. Rankin Farm	Concord,	1246
1326	do do 2	do do	Butler co.	1220
1327	Dougherty, No. —	do do	do	1219
1328	do do —	do do	do	1237
1329	Maggie	Ralston Farm	do.	1249
1330	Frank	do do	do	1224
1331	Hare	J. Starr Farm	do	1248
1332	Osceola	do do	do	1219
1333	Maud Jack	do do	do	1220
1334	Brawley & Overy	do do	do	1239
1335	Modoc	S. Troutman Farm	do	1227
1336	Hope, No. 2	do do	do	1228
1337	Hope, No. 1	do do	do	1229

WELLS NEAR MODOC AND GREECE CITY—*Continued.*

	Name.	Locality.	Township.	Elevation ab. ocean......
1338	High Flyer	S. Troutman Farm	Concord, Butler co.	1231
1339	Dead Beat	do. do.		1277
1340	Mohawk	do. do.	do.	1273
1341	Forest City	do. do.	do.	1272
1342	Smith	do. do.	do.	1249
1343	Hooker Jim	J. Sutton Farm	do.	1249
1344	Sutton	do. do.	do.	1261
1345	Darrar	do. do.	do.	1286
1346	Lady Sutton	do. do.	do.	1268
1347	Columbia Oil Co. No.2	do. do.	do.	1281
1348	do. do. No.-	do. do.	do.	1288
1349	Gordon, No. 19	S. M'Clelland Farm	do.	1281
1350	Miller Oil Co. No. 1	do. do	do.	1254
1351	Lady M'Clelland	do. do	do.	1269
1352	Glade	do. do	do.	1253
1353	Hoover	do. do	do.	1220
1354	M'Clelland, No. 1	do. do	do.	1200
1355	Preston	W. Brown Farm	do.	1185
1356	Maggie, No. 1	G. Barnhart Farm	do.	1170
1357	Denny	G. R. Campbell Farm	do.	1164
1358	Gordon	do. do.	do.	1161
1359	Collins' Bros.	do. do.	do.	1142
1360	Roberts	do. do.	do.	1147
1361	Woods & Ripley, No. 1	D. Barnhart Farm	do.	1137
1362	do. No. 2	do. do.	do.	1137
1363	Big Medicine	J. C. Brown (heirs) Farm,	do.	1279
1364	Olive	Jamieson Farm	do.	1123
1365	Sadie	do. do.	do.	1122
1366	Mary Ann	do. do.	do.	1117
1367	Constable, No. 1	do. do.	do.	1122
1368	Roberts	do. do.	do.	1142
1369	Morrison, No. 1	Morrison Farm	do.	1110
1370	do. No. —	do. do.	do.	1113
1371	Karns	do. do.	do.	1111
1372	Red Cross	do. do.	do.	1105
1373	Invincible	do. do.	do.	1110
1374	Preston, No 1	?	do.	1102
1375	Huselton	Huselton Farm	do.	1134

GROUP 7.

Wells East of Petrolia.

	Name.	Locality.	Township.	Elevation ab. ocean......
1376	School House, No. 1..	W. W. M'Dermott Farm,	Fairview,	1217
1377	M'Garvey, No. 1......	M'Garvey Farm..........	Butler co.	1273
1378	......do....No. —.....	......do.....do...........	.....do......	1225
1379	Forman, No. 3?	..... do.....do...........	.....do......	1354
1380	Boyle, No. 1..........	.. ...do.....do...........	.....do......	1354
1381	...do...No. 2..........	......do.....do...........	.....do......	1294
1382	...do...No. 3..........	......do.....do...........	.....do......	1330
1383	...do...No. 4..........	......do.....do...........	.....do......	1350
1384	Moreh'd&Lardin,No.2	Mortimer Farm...........	.....do......	1420
1385	Kerns, No. 6..........	Snow Farm...............	.....do......	1464
1386	H. L. T. & Co., No. —	Carner Farm..............	.....do......	1347
1387	.......do........No. 3,	...do.....do...............	.....do......	1404
1388	——— Well...........	...do.....do...............	.....do......	1366
1389	Lone Star, No. 1......	...do.....do...............	.....do......	1362
1390	Jennings, No. 5.......	Steele Farm..............	.....do......	1466
1391	.....do. ..No. 4.......	...do....do................	.....do......	1462
1392	Boss	J. Parker Farm..........	Perry, Arm-	1279
1393	Cummings, No. 1.....	Adam Peters Farm.......	strong co.	1230
1394	Hunter & Cummings,	Crawford Farm...........	.....do......	1384
1395	......do, No. 10, [No 9..	......do....do.............	.....do......	1320
1396	......do.........No. 11	......do....do.............	.....do......	1392
1397	B. B. I. Co., No. 4.....	B. Bend Tract............	Brady's B.,	850
1398	......do......No. 5.....	....do......do.............	Armst'g co.	852
1399	......do......No. 12....	....do......do.............	.....do......	972

GROUP 8.

Wells Near Karns City and Millerstown.

	Name.	Locality.	Township.	Elevation ab. ocean......
1400	Emerson&M'Cloud,No	L. Riddle Farm...........	Fairview,	1249
1401	.........do....No. 2, [1	....do.......do............	Butler co.	1244
1402	Grace................	....do.......do............	.....do......	1236
1403	Riddle, No. 16....	....do.......do............	.....do......	1238
1404	Say, No. 1............	Kinkaid Farm............	.....do......	1240
1405	..do...No. 5...........	....do.....do..............	.....do......	1244
1406	..do...No. 7...........	....do.....do..............	.....do......	1299
1407	Kinkaid...............	....do.....do..............	.....do......	1281
1408	Thompson............	A. Ford Farm............	.....do......	1338

WELLS NEAR KARNS CITY AND MILLERSTOWN—*Continued.*

	Name.	Locality.	Township.	Elevation ab. ocean.....
1409	Prentice, No. —	A. Ford ? Farm	Fairview,	1371
1410	....do....No. —	...do.......do.	Butler co.	1371
1411	Saulsbury	J. B. Campbell Farm	.....do	1292
1412	Bott Bros., No. —	J. P. Campbell Farm	.....do	1374
1413	Angel, No. 6	J. Moore Farm	.....do	1297
1414	...do...No. 9	....do.....do	.....do	1399
1415	Lady Moore	W. Moore Farm	.....do	1276
1416	M'Vey & Co., No. 1	....do.......do	.....do	1364
1417	Keystone	....do.......do	.....do	1393
1418	Hogan	B. B. Seibert Farm	.....do	1318
1419	Seibert	Seibert Farm	.....do	1385
1420	Uncle Hiram	...do....do	.....do	1387
1421	Sheakley, No. 2	Sheakley ? Farm	Donegal,	1388
1422	......do...No. —	......do......do	Butler co.	1186
1423	Wyatt, No. —	D. Barnhart Farm	Fairview,	1319
1424	Gordon Bros	.....do........do	Butler co.	1270
1425	Wyatt, No. —	.....do........do	.....do	1276
1426	Marcus Brownson	.....do........do	.....do	1303
1427	Bennett	.....do........do	.....do	1277
1428	Old Boyer	.....do........do	.....do	1259
1429	D. Barnhardt, No. 2	.....do........do	.....do	1201
1430	Scudder	Kepple Farm	.....do	1332
1431	M'Gill	Daubenspeck Farm	.....do	1310
1432	M'Michael	P. M'Dermott Farm	.....do	1342
1433	Cherry Tree	Hemphill Farm	Donegal,	1322
1434	J. Barnhart	Barnhart ? Farm	Butler co.	1169
1435	F. Barnhart	....do........do	.....do	1194
1436	Preston	J. Hemphill Farm	.....do	1168
1437	Little Joe	......do.......do	.....do	1164
1438	Shreve, No. ?	A. Stewart Farm	.....do	1195
1439	...do....No. 1	.....do.......do.	.....do	1210
1440	Blue Factory	Sheakley (heirs) Farm	.....do	1172
1441	M'Kinney, No. 2	Hemphill (heirs) Farm ?,	.....do	1163
1442	....do......No. 4	....do...........do	.....do	1179
1443	....do......No. —	....do...........do	.....do	1191
1444	Stoughton	Widow Hemphill Farm	.....do	1176
1445	Captain Jack	.......do............do	.....do	1189
1446	Shite Poke, No. 1	Frederick Farm	.....do	1172
1447	Warner	Warner Farm	.....do	1202
1448	M'Clintock	Millerstown	.....do	1150
1449	M'Collough	......do	.....do	1156
1450	Brown & Riss	......do	.....do	1164
1451	Brown & Co	......do	.....do	1160
1452	Thompson & Mechlin,	Fetzer & Myers Tract	.....do	1162
1453	Mechlin, No. 1	........do........do	.....do	1170
1454	M'Kinney Bros	........do........do	.....do	1171
1455	Ida	........do........do	.....do	1203
1456	Tom Collins	........do........do	.....do	1216
1457	Galey	........do........do	.....do	1229

GROUP 9.

Wells Between Millerstown and St. Joe.

	Name.	Locality.	Township.	Elevation ab. ocean ......
1458	M'Kinney, No. —	Hemphill (heirs) Farm	Donegal,	1225
1459	......do.....No. 12	do.........do	Butler co.	1277
1460	......do.....No. 13	do.........do	do	1304
1461	......do.....No. 17	do.........do	do	1366
1462	......do.....No. 19	do.........do	do	1387
1463	Angel Gas Well	Dugan Farm	do	1295
1464	Diviner, No. 1	Diviner Farm	do	1262
1465	...do....No. 2	...do.....do	do	1279
1466	...do....No. 3 ?	...do.....do	do	1379
1467	...do....No. 3 ?	...do.....do	do	1302
1468	...do....No. 4	...do.....do	do	1332
1469	...do....No. 5	...do.....do	do	1375
1470	...do....No. 6	...do.....do	do	1385
1471	...do....No. 7	...do.....do	do	1374
1472	Grace, S. & T.	Fetzer & Myers Tract	do	1381
1473	...do...F. & M.	do.........do	do	1402
1474	Weiser	M'Ginley Farm	do	1350
1475	Caldwell & Emery	....do......do	do	1357
1476	Shamburg & O'Hara	....do......do	do	1397
1477	Prentice, No. 1	....do......do	do	1411
1478	...do.....No. 2	....do......do	do	1374
1479	...do.....No. 3	....do......do	do	1404
1480	Adams & Friday	....do......do	do	1379
1481	M'Ginley, No. 3	....do......do	do	1393
1482	Black Maria	....do......do	do	1353
1483	Busted Ring	....do......do	do	1330
1484	Hart & Conkle	....do......do	do	1348
1485	Relief, No. 1	....do......do	do	1409
1486	...do...No. 2	....do......do	do	1368
1487	Hunter, No. 1	....do......do	do	1294
1488	.... do...No. 2	....do......do	do	1295
1489	Scudder	?	do	1264
1490	Smith	Dugan (?) Farm	do	1382
1491	Overy, No. 12	E. Duffy Farm	do	1369
1492	O'Reilly	....do......do	do	1339
1493	M'Allister, No. 1	M'Allister Farm	do	1318
1494	.....do.....No. 3	......do.....do	do	1389
1495	......do.....No. 5	......do.....do	do	1353
1496	Overy, No. 2	M'Laughlin Farm	do	1361
1497	...do...No. 6	......do......do	do	1385
1498	...do...No. —	......do......do	do	1355
1499	...do...No. —	Murphy Farm	do	1292
1500	Gillespie	Gillespie Farm	do	1329
1501	Burchfield, No. —	...do ......do	do	1321
1502	Prentice	C. Duffy Farm	do	1289
1503	Lechner	Lechner Farm	do	1359
1504	Tanner	M'Guire Farm	do	1316
1505	Showalter	....do.....do	do	1363
1506	Oakland, No. 4	....do.....do	do	1361
1507	Bronson&Harrington,	Boyd Farm	do	1367
1508	......do...No.—	..do....do	do	1389

Wells Between Millerstown and St. Joe—*Continued.*

	Name.	Locality.	Township.	Elevation ab. ocean......
1509	Bronson&Har'n	Boyd Farm	Donegal,	1400
1510	Riddle or Overy, No. 5	P. Murphy Farm	Butler co.	1371
1511	Mead, No. 2	J. Now Farm	do	1385
1512	..do....No. 3	..do.....do	do	1390
1513	do....No. 1	..do.....do	do	1294
1514	Bulger	..do.....do	do	1368
1515	Shidemantle	P. M'Guire Farm	do	1399
1516	Maid, No. —	do......do	do	1316
1517	..do...No. —	do......do	do	1366
1518	Emerson	J. Neff Farm	do	1388
1519	Bulger	J. Graham Farm	do	1346
1520	Armor	do....do	do	1400
1521	Burchfield	Graham (?) Farm	do	1379
1522	——Well, No. 3	do.........do	do	1346

GROUP 10.

Wells Near St. Joe and Carbon Centre.

	Name.	Locality.	Township.	Elevation ab. ocean......
1523	Bonanza	O'Donnell Farm	Donegal,	1398
1524	Fletcher, No. 3	P. Duffy Farm	Butler co.	1212
1525	Weiser	do.....do	do	1216
1526	Burns Gas Well	do.....do	do	1298
1527	Prentice No. 3	do.....do	do	1309
1528	Shirley	do.....do	do	1222
1529	R.Thompson Gas Well	Robt. Thompson Farm	Clearfield.	1162

GROUP 11.

Wells at Jeffersonville and Herman Station.

	Name.	Locality.	Township.	Elevation ab. ocean.....
1530	Humes, No. 1	Humes Farm	Clearfield,	1124
1531	....do...No. 2	...do....do	Butler co.	1161
1532	Summit, (No. 1)	Eichenlaub Farm	Summit,	1326
1533	Herman Oil Co., No. 2	......do .....do	Butler co.	1281
1534	Hunter	Schnure Farm	.....do	1191
1535	Kirk & Dilworth	Bingham Farm	Jeff'sn, But.	1263

GROUP 12.

Wells Between Foxburg, St. Petersburg and Turkey City.

	Name.	Locality.	Township.	Elevation ab. ocean.....
1536	Frazer	——— ———	Richland,	1153
1537	Gas Well	——— ———	Clarion co.	1138
1538	—— Well	Rupert Farm	.....do	1175
1539	Ashbaugh	Near St. Petersburg	.....do	1334
1540	Chambers	..do.......do	.....do	1333
1541	Edinger, No. —	N. E. of St. Petersburg	.....do	1324
1542	....do....No. —	..do..........do	.....do	1280
1543	Ashbaugh	..do..........do	.....do	1261
1544	Lone Walking Beam,	..do..........do	.....do	1238
1545	Hulings	..do..........do	.....do	1191
1546	Holliday & Ritts	Rits Farm	.....do	1235
.1547	Average of cluster of wells	N. E. of St. Petersburg	.....do	1240
1548	Race Bros.	Ritts Farm	.....do	1271
1549	Pioneer, No. 1	Neely Farm	.....do	1213
1550	Victor Ritter	Near Richland Furnace	.....do	1223
1551	Sold & Dallon, No. —,	......do..........do	.....do	1213
1552	......do... ....No. —,	......do..........do	.....do	1192
1553	Harley and Burzer	......do..........do	.....do	1120
1554	Wise	Caden Farm	.....do	1090
1555	M'Laughlin	Turkey Run	.....do	1100

Wells Near Turkey City and Dogtown.

	Name.	Locality.	Township	Elevation ab. ocean .....
1556	Lone Pine, No. 1	Near Turkey City	Richland	1131
1557	do No. 2	do do	Clarion co.	1130
1558	Faith	do do	do	1144
1559	Sanders	do do	do	1154
1560	Smith	do do	do	1167
1561	Alex. Panton	do do	do	1162
1562	Howard	Weller Farm	do	1177
1563	Neal	Near Turkey City	do	1186
1564	Brady	do do	do	1177
1565	Weller, No. 1	do do	do	1268
1566	Legal Tender	do do	do	1232
1567	Shammut	——— ———	do	1319
1568	Mingo Chief	Masters Farm	Beaver, Cla-	1339
1569	Baldy	do do	rion co.	1334
1570	Forest City, No. 1	——— ———	do	1361
1571	Dutch	Masters Farm	do	1410
1572	Masters (?)	do do	do	1418
1573	Hermage	do do	do	1450
1574	Ray & Miller, No. 1	Near Dogtown	d	1459
1575	Harold	do do	do	1483
1576	Last Chance	do do	do	1474
1577	Contest	do do	do	1468
1578	Stewart, No. 1	do do	do	1498
1579	M'Nulty	do do	do	1502
1580	Hardison	do do	do	1511

GROUP 14.

Wells Between Dogtown, Pickwick and Triangle.

	Name.	Locality.	Township.	Elevation ab. ocean . .
1581	Allhouse & Guffey	Hummel Tract	Salem,	1487
1582	——— Well	do do	Clarion co.	1473
1583	Gilbert, No. 2 (?)	do do	do	1451
1584	Martin & Myers		do	1475
1585	Harvick	Hummel (?) Tract	do	1451
1586	Smith Cook, No. 3	Pickwick	do	1417
1587	Hummel	do	do	1381
1588	Hickory Shade	do	do	1399

WELLS BETWEEN DOGTOWN, PICKWICK AND TRIANGLE—*Continued.*

	Name.	Locality.	Township.	Elevation ab. ocean .....
1589	M'Devitt	Near Pickwick	Salem,	1416
1590	Andrew Reid	..do......do	Clarion co.	1407
1591	Harley Bros	..do......do	do	1390
1592	Triangle City	Cropp Farm	do	1376
1593	Fertig	...do.. .do	do	1373
1594	Rush & Green	...do....do	do	1379
1595	Harley Bros	Delo Farm	do	1389
1596	Keily Bros	Cropp Farm	do	1403
1597	Allhouse & Cuner	N. W. of Pickwick	do	1366
1598	Wetter	....do........do	do	1373
1599	Hard Scrabble	....do........do	do	1315
1600	Thompson	....do........do	do	1368
1601	Sherman	Wid. Kribbs Farm	do	1404
1602	Guyer	N. W. of Pickwick	do	1326

GROUP 15.

Wells Near Pickwick and Edenburg.

	Name.	Locality.	Township.	Elevation ab. ocean .....
1603	Calamity	Wid. Kribbs Farm	Beaver,	1464
1604	Kiley Bros	Sam. Beals Farm	Clarion co,	1433
1605	Kiley Bros	Beals (?) Farm	do	1430
1606	Church	T. H. Axley Farm	do	1459
1607	Van Scovil	S. W. of Edenburg	do	1441
1608	Wetter	....do........do	do	1492
1609	M'Kay, No. 4	....do........do	do	1443
1610	——— Well	Haney Farm	do	1402
1611	——— Well	Bowers Farm	do	1443
1612	Horn Well	In Woods	do	1445
1613	Wynkoop & Co	Mendenhall Farm	do	1408
1614	——— Well	......do......do	do	1466
1615	Moran, No. —	......do......do	do	1336
1616	....do ..No. —	......do......do	do	1390
1617	Goss Bro., No. 1	J. Best Farm	do	1550
1618	Swetzer, No. 2	Edenburg	do	1548
1619	Chambers, No. —	N. Knoll Farm	do	1537
1620	....do......No. —	....do......do	do	1560
1621	Turner & Co	North of Edenburg	do	1403
1622	Gray	......do......do	do	1367
1623	M'Guire & Co	......do......do	do	1355
1624	Antwerp Pipe Co	......do......do	do	1354
1625	St. Lawrence	......do......do	do	1396
1626	Detroit	......do......do	do	1396
1627	Balliot & Lee, No. 2	......do .... do	do	1375

WELLS NEAR PICKWICK AND EDENBURG—*Continued.*

	Name.	Locality.	Township.	Elevation ab. ocean......
1628	Snooks, No. —........	Near Edenburg...........	Beaver,	1347
1629	....do...No. —...	..do......do..................	Clarion co.	1342
1630	Painter & Warner....	..do......do..................	......do.....	1290
1631	Bradley, No. —........	..do......do..................	......do.....	1349
1632	... do ....No. —	..do......do..................	......do.....	1296
1633	Hulings, No. —.........	..do......do..................	......do.....	1353
1634	....do.....No. —	..do......do..................	......do.....	1325
1635	Grant & Aikins........	..do......do..................	......do.....	1406
1636	Black.................	Black Farm	......do.....	1260
1637	Hope	Near Shippenville.........	Elk,	1324
1638	Gray Bros	.:do.......do.................	Clarion co,	1410
1639	Berlin Gas Well......	North of Shippenville....	......do.....	1423
1640	G. W. Berlin	......do ....do............	......do.....	1404

GROUP 16.

Wells at Bullion Run, Venango County.

	Name.	Locality.	Township.	Elevation ab. ocean......
1641	Baum..................	Furnace Tract............	Clinton,	1057
1642	Galey, No. 1..........	Galey Farm	Venango co,	1127
1643	...do ..No. 2..........	...do....do...............	......do.....	1122
1644	Simcox, No. 3	Simcox Farm............	......do.....	1222
1645	Galey, No. 4..........	Galey Farm	......do.....	1231
1646	Dean, T. & S., No. 1 ..	Taylor Farm.............	......do.....	1313
1647	...do.....do ...No. 2..	...do.....do.............	......do.....	1271
1648	Short (?).............	Short Farm...............	......do.....	1311
1649	Nesbitt	Sutton Farm..............	......do.....	1442
1650	H. L. T. & Co.........	...do....do	......do.....	1441
1651	Phillips, No. 1........	Davis Farm...............	......do.....	1442
1652	....do ....No. 2........	...do....do...............	......do.....	1441
1653	M'Donald	Sutton Farm	......do.....	1439
1654	Phillips...............	Galey (?) Farm	......do.....	1430

CHAPTER XXVI.

ON THE RESULTS OF SURVEYS IN 1876-7 MADE FOR THE PURPOSE OF RECTIFYING THE SYSTEM OF RAILROAD AND OIL WELL LEVELS THROUGHOUT NORTH-WEST PENNSYLVANIA.

BY J. F. CARLL, ASSISTANT GEOLOGIST IN CHARGE OF THE SURVEY OF THE OIL REGIONS.

(Read before the American Philosophical Society, May 4, 1877.)

No attempt has heretofore been made to compare and adjust the levels of the numerous lines of railroads interlacing the Oil Regions; consequently considerable misapprehension exists, not only as to the true ocean levels, but also as to the relative levels of many places frequently quoted and taken as points from which to calculate the fall of the surface and streams, or the dips of the oil rocks.

Within this district not one point of elevation has been *proven* to be correct. Harrisburg, Pittsburg and the surface of Lake Erie are the nearest reliable points we have; and their true heights above mean ocean level have only recently been fixed through the well directed and successful efforts of Mr. Jas. T. Gardner, Geographer to the United States Geological and Geographical Survey of the Territories, under the charge of Dr. F. V. Hayden, United States Geologist.

These elevations above mean surface of the Atlantic ocean—Harrisburg 320′, Pittsburg 745′, and Lake Erie 573′—are now adopted; and from them we propose to carry forward the railroad lines of this district, to compare their intersections and junctions, and to fix and adopt certain points of elevation on which to base our geological work.

This, perhaps, should have been one of the first tasks of the Survey, but the material for it could not at that time have been immediately obtained; for even now, after working toward the point for three years, much is wanting to make the adjustment as complete as could be wished.

The road most closely connected with the work of this district is the Pittsburg, Titusville and Buffalo railway.† It passes through the heart of the Oil Regions, along the valleys of the Allegheny river and Oil Creek from Pittsburg to Corry, and thence over the "divide" to Brockton. Unfortunately, its levels have been very unreliable; not so much, as we discover, now, from inaccuracy in the original instrumental work, as from a want of care in adjusting the datum planes of the several roads composing the present continuous line, to ocean level.

The elevation of Oil City, based on these levels, has been variously given from 995′ to 1,049′ above tide.* Other places along the line have varied in the same manner, but not to so great a degree. There was also a want of agreement with the railways intersecting it, at the West Pennsylvania railroad junction, at Red Bank, at Parker's, at Oil City, and at Corry. In 1875 the engineers in charge of the A. V. R. R. re-leveled its track from Kittanning up to South Oil City, but their work was based on the Kittanning bench-mark, the true elevation of which was in doubt. So that previous to the commencement of these examinations and our adjustment of the levels, we had not been able to secure a single elevation along the A. V. R. R. on which it seemed safe to rely.

As the shortest way out of these difficulties, and to establish some reliable base for the use of the survey, a re-leveling of the road, as far as might be necessary, was resolved upon. Accordingly, early in February, 1877, Mr. John H. Carll and Mr. Arthur Hale, provided with a superior railroad level and staff, proceeded to Pittsburg to commence the work.

Every facility was afforded by the chief engineer of the railway, Mr. H. Blackstone, to whom our thanks are due for these courtesies, for the examination of profiles and note books, and all the data of use secured from the office of the railroad company.

Our levels were commenced at the Union depot bench-mark, and carried forward continuously to the old Kittanning bench-

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*Meaning mean *high* tide at Philadelphia, Pennsylvania railroad datum.

† This road is composed of the A. V. RR. from Pittsburg to Oil City, the Oil Creek RR. to Corry, and the Cross Cut RR. to Brockton.

mark. A table comparing the results with a railway profile is appended. It shows a difference of only $\frac{22}{100}$ of a foot between the railway profile elevation of the Kittanning bench-mark and our own; and establishes the height of this bench at 809.94′ above the mean surface of the Atlantic ocean.*

From Kittanning to South Oil City there is a rise of 299.20′, according to the railroad levels of 1875. But in a table of elevations furnished the Smithsonian Institution by the engineer of the road shortly after its completion, the difference between the same points is given as 298′. The levels of 1875, consequently, make the elevation of South Oil City 1,009′, the old levels 1,008′.

From W. Pennsylvania Junction our re-leveling was carried on up the Butler Branch railroad to Great Belt City. Here connection was made with our line carried along the oil belt by Messrs. Hatch and Hale in 1875, and by Messrs. Chance and Hale in 1876. This last named line was then adjusted to the Pittsburg datum, traced back to Parker's depot and found to coincide there within $\frac{4}{10}$ of a foot with the Allegheny Valley railroad, corrected elevation—thus showing a very reliable circuit from Allegheny Junction to Great Belt, from Great Belt to Parker's, and from Parker's back to Allegheny Junction. So far the levels appear to be satisfactory.

From Parker's to Oil City the following check was kindly furnished by Mr. D. Jones Lucas, resident engineer of the Union Pipe company. Mr. Lucas ran a line of levels across the country in 1875 from Parker's depot to Oil City, (Union Depot,) and found the difference in elevation to be 118.9′. This, added to our accepted elevation of Parker's, 889′, gives 1,008′ as the proper height of Oil City (U. Dep.) which is 0.45′ lower than the South Oil City depot.

We now have these figures, using the decimals, for Union Depot, Oil City.

By levels of 1875, Kitt. bench	809.94+199.20—0.45=1008.69
By Old levels......do....do	809.94+198.00—0.45=1007.49
By Mr. Lucas, Parker's Depot	889.4+118.90=1008.30

It seems safe therefore to accept 1,008′ as the established elevation of this point.

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*As established by United States Coast Survey in New York harbor.

Our levels thus adjusted to Oil City, the next step was to connect the termini of the several Railroads centering there, with the Union Depot. When this was done the following rather discouraging results appeared:

Union Depot accepted elevation	1008′
Do....do ..by levels of O. C. & A. R. R	995′
Do....do ..do.....do...A. & G. W. R	1007′
Do....do ..do.....do...L. S. & M. S. R	1011′

The O. C. & A. R. levels appear to agree with the P. & E. and were supposed to be based on the P. R. R. datum at Philadelphia, which required an addition of 7′ to reduce it to ocean and make it conform to Lake Erie at 573′ above ocean. The A. & G. W. and L. S. & M. S. levels came in direct from Lake Erie. There was evidently some error between Oil City and the Lake if our accepted elevation of the Union Depot was correct. We endeavored to find it by connecting together the several Depots and bench-marks obtained from the railroad profiles, at Franklin, Irvineton, Corry, Union City and Erie, but did not succeed, and finally as a last resort, re-leveled the P. & E. R. R. from Union City to its junction with the L. S. & M. S. at Erie, and to the Lake.

To our surprise, the profile of the P. & E., which had been considered unreliable, was found to be remarkably correct, except as to ocean datum. The stations checked closely in every case, except in one or two instances where no doubt there had been an alteration of track, and the difference of elevation between Union City and the crossing at Erie as given by it and as ascertained by our levels varied only 0.08′.

By connecting the P. & E. Depot at Union City with the A. &. G. W. Depot at the same place it was found that these two roads gave precisely the same fall from Corry crossing to Union, so that it was not deemed necessary to re-level that part of the P. & E. Rail Road.

From the Erie crossing above mentioned, connection was made with the L. S. & M. S. Depot at Erie, and, also, a line was run direct to the Lake. The line to the Lake confirmed the elevation given by the L. S. & M. S. R. R. for the Depot at Erie. It showed about six inches less elevation, but this is probably due to full water in the lake at this season of the year.

The P. & E. levels may therefore be considered as well tested and checked from the lake to Corry crossing, and they establish the latter point as will be seen further on at 1,427′ above ocean (at New York).

When we inquire into the reason why 1,416′ was given on the old P. & E. profile as the elevation of the old Corry depot, and A. & G. W. Crossing, instead of 1,427′ as it should be; we find that the levels of this end of the road, as far east as Warren (how much farther we do not know) were run from the Lake. They were based on lake level at 565′, the accepted elevation of the lake at the date of that Survey, and were consequently 8′ too low. In addition to this there seems to have been an error in placing the old P. & E. Lake Depot 8′ above the surface of the Lake. It should have been 11′ as the levels now show. It appears quite probable that this 3′ error in starting at the lake was discovered and corrected in some of the engineer's notes, for I have a copy of the levels from Irvineton, west, procured from the Smithsonian Institution in which the Stations are all raised 3′ above Burgin's profile. This 3′ error added to the 8′ difference between former and present accepted lake level, makes the 11′ which we are obliged to add to raise the road to its proper height above the ocean and to place it in its true horizon to meet the levels brought up from Pittsburg.

The first elevation given on the P. & E. profile as published (Crossing of the L. S. & M. S. R. R.) shows very plainly that there is an error of 11′ between that point and the Lake thus:

L. S. & M. S. Crossing by P. & E. profile (VIII) .... = 676
Do........do ....L. S. & M. S. profile (XI) .... = 687
Do........do ....Carll's levels to lake........................ = 687

As the levels and checks above mentioned appear to establish the correctness of the P. & E. profile from the Erie crossing to Corry we see no reason to doubt its integrity as far as the same parties carried forward their line, which we are informed by one who assisted in the Survey, was as far as Warren. We therefore propose to raise all the stations between the Lake and Warren 11′.

We now find that the Union and Titusville or O. C. & A. R. R. R. * must be raised 13′ at Union City above the published

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* The U. & T. is now a branch of the O. C. & A. R. R. R.

levels to lift it to the P. & E. at that place, and 13′ also at the other end at Irvineton to make it coincide there with the P. & E. This brings Oil City up also and makes it agree (995′+13′=1008′) with our accepted elevation, as will be shown further on.

Another interesting fact is brought to light by this discussion. The levels of the O. C. & A. R. R. were run from a datum given in the field book as "Elevation of track on bridge east of Irvineton Station on P. & E. R. R. above tide water at west end of Market Street bridge at Philadelphia=1160."

This is, no doubt, the point given by Burgin as "Irvine 1162" and it explains why (having started 2′ too low) the O. C. & A. R. R. requires to be raised 13′, while the P. & E. is only raised 11′. It also shows that the O. C. & A. R. R. datum was not the P. R. R. datum as supposed, but ocean datum, based on Lake Erie at 565′, subject to the same error of 11′ as the P. & E. with the additional 2′ made in the starting point at the bridge.

The two tables of the P. & E. levels (the Company's and Burgin's) given by Mr. Allen, in his R. R. levels of Pennsylvania, contain in themselves the evidences of inaccuracy. The Company's profile datum is "Mid tide Baltimore." Burgin's is P. R. R. datum on the east end and Lake Erie based on ocean on the west end (but now shown to be 11′ too low), yet both profiles give the same elevation at Corry crossing, and I believe, run exactly together from Corry to the lake, if they could be compared at precisely the same points. They seem both to have been made from one line of levels. Where the error in joining the line run from the east with the line run from the west may have occurred, we do not know,* but certain it is that no "P. R. R. datum" or "mid tide Baltimore datum" levels have been correctly brought through to Irvineton.

Mr. Gardner, in his discussion of R. R. levels to establish the surface elevation of Lake Erie, says, Lake Erie is above Harrisburg by P. & E. levels 251′; this added to the height of

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*It seems quite probable, we think, that the error will be found between West Creek Summit near St. Mary's and Clarion Summit near Kane. In that case West Creek Summit should be raised 19′, to correspond with Emporium, and all stations between Kane and Warren 11′, to correspond with the Lake end of the line.

Harrisburg, 319.75′=Lake Erie 570.75′. If the levels of this road were run from Harrisburg west and from the lake east, it is perceived at once that the P. & E. levels had nothing whatever to do with the difference of elevation between Harrisburg and the lake. It was only the difference between 314′, the starting point at Harrisburg as given by Burgin, and 565′, the starting point at Erie. The Harrisburg end was raised 5.75′ to bring it up to correct ocean level, the lake end 8′ to bring it up to accepted lake level; consequently the line showed an error of 2.25′, making Lake Erie 570.75′ instead of 573′. Of course it was supposed that the levels were connected throughout, but they could not have been correctly connected in fact, for we shall show that while the western end requires to be lifted 11′ the centre needs to be raised from 19′ to 23′.

We have met this same trouble in other roads in this district, where they have been run from one known, or supposed to be known, elevation to another. They agree at each end with the points given, but our cross checks lead to the suspicion that it has required some adjustment and alteration of the levels actually obtained to make them do so.

The re-leveling of the P. & E. RR. and the corroborative circumstances above given should establish the correctness of our Union City adopted elevation of 1,270′ and our Corry adopted elevation of 1,427′ at the crossing of P. & E. and A. & G. W. railways almost beyond a question. They cannot vary more than the fraction of a foot from the figures here given. They also furnish the data from which to adjust the levels of the O. C. & A. R. and Union and Titusville railways leading from the P. & E. to Oil City, as will be seen below.

Absolute accuracy is not, of course, to be expected in an adjustment of this kind, where the levels of different roads are to be tied together and compared. Slight errors necessarily creep into every profile—by the change in engineers employed, and consequent mistakes in benches and level points, which often are not plainly marked or described in the notes as they should be; by local alterations of track or change in position of depots not always carefully noted; by alterations at junctions and crossings made by one road and not recorded by the other;

and by clerical errors in copying and working up the notes and profiles.

In making these adjustments considerable time has been spent in the field in ascertaining the relative levels of depots, crossings, benches, &c. —at Pittsburg, Allegheny City, Freeport, Parker's, Franklin, Oil City, Irvineton, Titusville, Corry, Union City, Erie City, Girard and other places, and in every case more or less variation has been found, relatively, in the points given—comparing them as they now are and as they were when originally established. These sources of error cannot now be eliminated without a careful re-leveling of the railway lines, which manifestly is an impossibility under the circumstances. It only remains for us to make the best practical use we can of the materials at command. As we have shown that they are somewhat defective, it would be folly to pretend to work out these hypsometric elevations to the decimal part of a foot. We shall not attempt it, but aim only to establish the levels of some of the more important points in this district within a foot or two of the truth, which is near enough for all practical purposes.

A.

The first line considered will be from Pittsburg to Lake Erie by the Allegheny Valley, Bennett's Branch, Philadelphia & Erie, and Buffalo, N. Y. & Erie Railways.

			Ab. ocean.
Pittsburg U. Depot	....	Accepted elevation	745
Red Bank Junct.	106	Above Pittsburg by A. V. profile (I)	851
Do......do	832	Above ocean by Bennett's Branch profile (IV).	
Do......do	19	Too low on Bennett's Branch profile.	
Driftwood Junct.	37	Below Red Bank Junct. by B. Branch profile (IV)	814
Do......do	795	Above ocean by P. & E. profile (Note to IV).	
Do......do	19	Too low on P. E. profile.	
Emporium Junct.	208	Above Driftwood Junc. by P. & E. profile (Allen CCXV)	1022
Do......do	1003	Above ocean by P. & E. profile (Allen CCXV).	
Do......do	1021	Above ocean by B. N. Y. & P. profile (XVII).	
Do......do	19	Too low on P. & E. profile.	
Do......do	1	Too low on B. N. Y. & P.	

			Ab. ocean,
Olean Crossing......	414	Above Emp. Junct. by B. N. Y. & P. profile (XVII)	1436
Do......do	1438	Above ocean by N. Y. & Erie profile (Jersey City datum).	
Do .....do	1435	Above ocean by B. N. Y. & P. profile.	
Do......do	2	Too high on N. Y. & Erie profile.	
Do......do	1	Too low on B. N. Y. & P.	
Lake Erie...........	862	Below Olean Crossing by B. N. Y. & P. profile (XVII).	
Do..do	864	Below Olean Crossing by N. Y. & Erie profile (XVIII).	
Do..do	863	Below Olean—mean of the above levels..	573

This line, it will be noted, lifts all the levels from Red Bank Junction to Emporium Junction 19 feet, and the B. N. Y. & Philadelphia levels 1′ as far as Olean. It crosses the N. Y. & Erie Railway at Olean, two feet below the Erie levels which were run from tide at Jersey City, and would reach the Lake one foot too high if carried down by the B. N. Y. & Philadelphia levels, which give 862′ fall. But we find that the N. Y. & Erie levels give 864′ fall, so that a mean between the two, 863′ subtracted from 1436′=573′, the precise elevation as accepted for Lake Erie. The B. N. Y. & Philadelphia levels are said to have been run from the water of Buffalo Creek some distance from the lake, and may therefore be presumed to be based on a higher point than lake level.

Variations of from one to three feet will be found between different lines at nearly every point we are attempting to compare. As we are only using even feet in making this adjustment, a disagreement of one foot may sometimes occur in this way between two roads where there would really be but a very slight difference if the decimals were accurately taken into account.

B.

Pittsburg to Lake Erie, by the Allegheny Valley, Oil Creek and Allegheny River, Union and Titusville, and Philadelphia and Erie Railways.

			Ar. ocean.
Pittsburg		Accepted elevation	745
Oil city U. Depot	263	Above Pittsburg by A. Valley profile (I)	1008
Do......do	995	Above ocean by O. C. & A. R. profile (VI).	
Do......do	1007	Above ocean by A. & G. W. profile (X).	
Do......do	1011	Above ocean by L. S. & M. S. profile (XII).	
Do......do	13	Too low on O. C. & A. R. profile.	
Do......do	1	Too low on A. & G. W. profile.	
Do......do	3	Too high on L. S. & M. S. profile.	
Titusville	186	Above Oil City by O. C. & A. R. profile (VI)	1194
Do	1181	Above ocean by O. C. & A. R. profile (VI).	
Do	1181	Above ocean by U. & T. profile (VII).	
Do	13	Too low on O. U. & A. R. profile.	
Do	13	Too low on U. & T. profile.	
Union City P. & E. Depot.		Accepted elevation established by levels from the lake	1270
Do........do	177	Above Titusville by U. & T. profile (VII) (1271).	
Do........do	1258	Above ocean by U. & T. profile (VII).	
Do........do	1259	Above ocean by P. & E. profile (VIII).	
Do........do	12	Too low on U. & T. profile.	
Do........do	11	Too low on P. & E. profile.	
Erie City L. S. & M. S. & P. & E. crossing.	583	Below Union City by P. & E. profile (VIII)	687
Do........do	583	Below Union City by levels run by J. H. Carll	687
Do........do	676	Above ocean by P. & E. profile (VIII).	
Do........do	11	Too low on P. & E. profile.	
Erie City L. S. & M. S. Depot.	0.72	Below Erie crossing (Carll's levels)	686
Do........do	......	Above ocean by L. S. & M. S. profile (XI)	686
Do........do	113	Above lake by L. S. & M. S. profile (XI)	
Do........do	113	Above lake by Carll's levels.	
Lake Erie	......	As above 686–113	573

This determination shows a very satisfactory line of levels from Pittsburg to the lake by raising the O. C. & A. R. and Union & Titusville railways 13 feet and the P. & E. railway 11 feet, and by throwing off all the decimals on the Allegheny slope and making the most of them on the lake slope. But even by doing this there is still an error of one foot to be accounted for at Union City, which is referred to more fully in remarks following determination C.

Mr. Gardner, in summing up his conclusions on the elevation of Pittsburg, says he is inclined to accept 746 in preference to 745 for the elevation of the Union Dépôt. But the levels of the railroads leading to the lake through this district conform better to the height we have adopted (745) and might even seem to suggest a lower level for Pittsburg.

C.

Oil City to Lake Erie, by the Oil Creek and Allegheny River railway to Irvineton and the P. & E. railway from Irvineton to the lake—using Burgin's profile of the P. & E. railway.

			Ab. ocean.
Oil City		Accepted elevation........................	1008
Irvineton Bridge....	165	Above Oil City by O. C. and A. R. profile (VI)....................................	1173
Do........do	1162	Above ocean by P. & E. profile (VIII).	
Do........do	1160	Above ocean by O. C. & A. R. profile (VI).	
Do........do	11	Too low on P. & E. profile.	
Do........do	13	Too low on O. C. & A. R. profile.	
Corry Crossing A. & G. W. & P. & E.	254	Above Irvineton by P. & E. profile (VIII)....................................	1427
Do........do	1416	Above ocean by P. & E. profile (VIII).	
Do........do	1429	Above ocean by A. & G. W. profile (IX).	
Do........do	1418	Above ocean by O. C. & A. R. profile (VI)	
Do........do	11	Too low on P. & E. profile.	
Do........do	9	Too low on O. C. & A. R. profile.	
Do........do	2	Too high on A. & G. W. profile.	
A. & G. W. Depot, Union City.	128	Below Corry by A. & G. W. profile (IX)	1299
Do....do	1301	Above ocean by A. & G. W. profile (IX).	
Do....do	2	Too high on A. & G. W. profile.	
P. & E. Depot Union City..........	29.22	Below A. & G. W. Depot, Union City (Carll)..................................	1270
Do....do	157	Below Corry crossing by P. & E. profile (VIII)	1270
Do....do	1259	Above ocean by P. & E. profile.	
Do....do	11	Too low on P. & E. profile.	
L. S. & M. S. & P. & E. Erie Crossing.	583	Below Union City by P. & E. profile (VIII)..................................	687
Do....do	583	Below Union City by Carll's levels......	687
Do....do	114	Above Lake Erie by L. S. & M. S. profile and Carll (XI)........................	687
Do....do	676	Above ocean by P. & E. profile.	
Do....do	11	Too low on P. & E. profile.	
Lake Erie	114	Below P. & E. and L. S. & M. S. crossing as above..................................	573

The levels of the Dunkirk, Allegheny Valley and Pittsburg RR. touching the P. & E. at Irvineton, are so widely astray and evidently unreliable as heretofore published that we can make no use of them in this connection to reach the lake. A trip to Dunkirk expressly for the purpose of examining the profiles, with a view of including the levels of the road in this discussion, resulted unsuccessfully from the want of a permit from headquarters in New York, and we are obliged to omit them altogether.

So too, unfortunately, with the Buffalo, Corry and Pittsburg railway, crossing the P. & E. at Corry, which would have given another link to the lake at Brocton. The published levels are so vague and uncertain that we must omit them also. Mr. Ashmead kindly permitted and assisted in a thorough search among the papers in his office at Oil City, but no profile or connected notes of the levels could be found.

If our accepted elevations of Irvineton, Corry and Union City are correct, and we have every reason to believe that they are, it appears quite evident that there must be some mistake in the levels of the O. C. & A. R. and U. & T. Railways, otherwise they would agree with our accepted elevations, if raised uniformly 13′ at all points, instead of 13′ at Irvineton, 9′ at Corry and 12′ at Union City. They start as we have shown at an elevation of 1,160′ at Irvineton, which represents 1,162′ on the P. & E. profile, and running around by Oil City and Titusville, reach Union City at 1,257′ which should represent 1,259′ on the P. & E. profile if all the levels were harmonious. From the published tables it would be inferred that the P. & E. Depot in the U. & T. tables was the same as the P. & E. depot in the P. & E. tables; but the U. & T. profile shows that the point 1,257′ was the junction with the P. & E. and this junction is 1.39′ lower than the depot. There is therefore a disagreement of one foot or more between the two lines of levels from Irvineton to Union City, the P. & E. being about 34 miles in length and the O. C. & A. R. and U. & T. about 92 miles. This is not sufficient to cast doubt upon the main line of levels and we therefore accept them as correct as far as Tryonville Junction, presuming that the error lies somewhere quite near Union City, for we find our levels there between the crossings and Depots to differ quite materially from those given by the U. & T. profile, as will be seen by reference to Union City levels.

We now have these three points apparently well established.

Tryonville Junction	1320′
Corry	1427′
Union City	1270′

Tryonville Junction is 111′ below Corry by O. C. & A. R. (VI).
Do........do ...... 49′ above Union City by U. & T. (VII).

Then caculating the elevation of Tryonville Junct. from Corry and Union City we have:

Tryonville by O. C. & A. R. levels 1427 — 111 = 1316.
Do.... by U. & T.........do...1270 + 49 = 1319.

The relative elevations of Corry and Union City are well assured by the exact agreement of the P. & E. and A. & G. W. levels between those places, and we therefore can only conclude that there is an error of one foot to be accounted for on the U. & T. profile between Tryonville Junct. and Union City, and an error of 4′ on the O. C. & A. R. profile between Tryonville and Corry which we have been unable to place and must, therefore, leave for future adjustment.

D.

Oil City to Ashtabula, by Franklin Branch of Lake Shore and Michigan Southern Railway.

			Ab. ocean.
Oil City	......	Accepted elevation	1008
Stoneboro	160	Above Oil City by L. S. & M. S. profile (XII)	1168
Do	1171	Above ocean by L. S. & M. S. profile (XII)	
Do	1171	Above ocean by N. C. & F. profile (XIV)	
Do	3	Too high on L. S. & M. S. profile.	
Do	3	Too high on N. C. & F. profile.	
Salem Crossing	184	Below Stoneboro by L. S. & M. S. profile (XII)	984
Do.....do	987	Above ocean by L. S. & M. S. profile (XII)	
Do.....do	982	Above ocean by A. & G. W. profile (IX)	
Do.....do	3	Too high on L. S. & M. S. profile.	
Do.....do	2	Too low on A. & G. W. profile.	
Jamestown	3	Above Salem Crossing by L. S. & M. S. profile (XII)	987
Do	990	Above ocean by L. S. & M. S. profile (XII)	
Do	979	Above ocean by E. & P. profile (XIII).	
Do	3	Too high on L. S. & M. S. profile.	
Do	8	Too low on E. & P. profile (*a*).	
Ashtabula	342	Below Jamestown by L. S. & M. S. profile (XII)	645
Do	648	Above ocean by L. S. & M. S. profile (XII)	
Do	3	Too high on L. S. & M. S. profile (*b*).	

(same level, ference in their elevations. vrong wherever we check it.

(*b*) These levels, according to profile, run into Ashtabula at the proper elevation (74.52) to agree with the levels of the main line which are accepted as correct. But it is hard to explain why the Franklin Branch overruns the A. & G. W. at Salem Crossing, at Franklin, at Reno, and at Oil City, while the same levels of the L. S. & M. S., taken at Erie Crossing and carried to Union City by the P. & E. Railway, run under the A. & G. W. at that place. *The P. & E. levels from Erie to Union City* were re-run but no error could be discovered there. *We have no ground for charging the whole mistake to the A. & G. W.*, for their levels, as will be seen in another place, bear every evidence of *more than ordinary precision from Salamanca to Dayton.* It would appear as if the Franklin Branch of the L. S. & M. S. had been started from a higher point than that given on the main line as 74.52. But this, of course, is an inference only and may be entirely wrong.

E.

From Pittsburg to Stoneboro, by Pittsburg, Fort Wayne and Chicago to Homewood, New Castle and Beaver Valley to New Castle, and New Castle and Franklin to Stoneboro.

			Ab. ocean..
Pittsburg	......	Accepted elevation	745
Homewood	204	Above Pittsburg by P. F. W. & C. profile (XVI)	949
New Castle	147	Below Homewood by N. C. & B. V. profile (XV)	802
Do	809	Above ocean by E. & P. profile (XIII) (*a*)	
Do	7	Too high on E. & P. profile.	
Stoneboro	368	Above N. Castle by N. C. & F. profile (XIV)	1170
Do	160	Above O. City by L. S. & M. S. profile (XII) accepted (*b*)	1168
Do	1171	Above ocean by L. S. & M. S. profile (XII)	
Do	1171	Above ocean by N. C. & F. profile (XIV)	
Do	2	Too high by levels brought from Pittsb'g	
Do	3	Too high on L. S. & M. S. profile.	
Do	3	Too high on N. C. & F. profile.	

(*a*) It is supposed that the elevation here given by the E. & P. refers to a point somewhat higher than the present Depot.

(*b*) We prefer to accept 1,168′ as the elevation of Stoneboro instead of 1,170′, or 1,171′ for several reasons. From Pittsburg to Oil City by the line just followed we find a rise of 265′, while from Pittsburg direct to Oil City by the Allegheny Valley Railway levels well tested we have a rise of 263.′ There is an error of 2′ feet somewhere in the circuit. The L. S. & M. S. levels are too high at Oil City when compared with the A. V., the O. C. & A. R. and the A. & G. W.; they are too high again at Franklin, compared with the A. V. and A. & G. W.; too high at Salem Crossing, compared with the A. & G. W.; and too high at Jamestown compared with the E. & P. We are not certain that the connecting link between N. Castle and Stoneboro show precisely the difference in elevation between the Depot of the N. C. & B. V. at N. Castle and the Depot of the L. S. & M. S. at Stoneboro. There might easily be a difference of 2′ between the Depots of the N. C. & F., and those of the other roads named. Our accepted level at Oil City appears to be a mean between the highest and lowest levels given wherever a check can be secured, and it therefore seems safe to adhere to it.

F.

Review of the levels of the Atlantic and Great Western Railway.

			Ab. ocean.
Salamanca............	1393	Above ocean by A. &. G. W. profile (IX). Point given as centre of Hemlock street.	
Do................	1384	Above ocean by N. Y. & Erie profile (XVIII). Supposed to be the old Depot.	
Present Depot........	1.3	Lower than Hemlock street. (Carll).	
Old Depot............	14.2	Lower than Hemlock street. (Carll).	
Present Depot........	1392	Above ocean by A. & G. W. levels (1393—1).	
Do....do..........	1397	Above ocean by N. Y. & Erie levels (1384+13.	
Do....do		Accepted elevation.......................	1393

The N. Y. & Erie, as before stated, reaches the lake 2′ too high, so that there appears to be but 3′ disagreement between the levels of the A. &. G. W. and N. Y. & Erie, if we have taken our points correctly, and 1,393′ will be a fair mean between the two for the present depot.

Levant, Accepted elevation as given by A. & G. W. (IX)............... 1,267

The D., A. V. & P. Railway coming up from the lake at Dunkirk crosses the A. & G. W. here. The elevation given by it is 1,262′ (Allen CCCVI), but it does not appear to be reliable.

Corry, A. & G. W. 2′ too high as shown in C.

Union City, A. & G. W. 2′ too high as shown in C.

Salem Crossing, A. & G. W. 2′ too low as shown in D.

			Ab. ocean.
Clarkesville Cross'g,	46	Below Salem Crossing (D) = 984-46......	938
Do...........	936	Above ocean by A. & G. W. profile (IX)	
Do...........	930	Above ocean by E. & P. profile (XIII).	
Do...........	2	Too low on A. & G. W. profile.	
Do...........	8	Too low on E. & P. profile.	

At Jamestown the E. & P. was 8′ too low (D) by our accepted elevation, and 11′ too low by L. S. & M. S. levels, and here we find it 8′ too low by our adjustment, and 6′ if the A. & G. W. is correct—while at N. Castle (E) it is 7′ too high. In the first and last places the difference may be in a measure due to a want of unity in the points given by the several roads, but until we have more positive information on these points, the E. & P. levels must be regarded as very unreliable.

Further Checks on the A & G. W. Railway in Ohio:

			Ab. ocean.
Ravenna Crossing...	522	Above Lake Erie by A. & G. W. profile. See Ohio Geological Report, Vol. I, p. 667..............................	1095
Do...........	519	Above Lake Erie by Cleveland & Pittsburg profile. (Authority, J. Linton, Chief Engineer)........................	1092
	3	Disagreement.	
Newburg Crossing...	175	Above Lake Erie by A. & G. W. profile (IX)	748
Do..........	174	Above Lake Erie by C. & P. profile, (Linton).......................................	747
	1	Disagreement.	
Gallion................	596	Above Lake Erie by A. & G. W. profile. (O. R. I, p. 667)..........................	1169

			Ab. ocean..
Gallion.............	595	Above Lake Erie by C. C. C. & I. profile. (O. R. I, page 668)......................	1168
	1	Disagreement.	
Urbana.............	454	Above Lake Erie by A. & G. W. profile. (O. R. I, p. 667).........................	1027
Do..............	458	Above Lake Erie by S. D. & C. profile. (O. R. I, p. 671).........................	1031
	4	Disagreement, relative levels of depots unknown.	
Dayton.............	179	Above Lake Erie by A. & G. W. profile. (O. R. I, p. 667).........................	752
Do................	180	Above Lake Erie by D. & M. profile. (O. R. I, p. 671.............................	753
	1	Disagreement.	

The Dayton and Michigan Railway check is used by Mr. Gardner (page 644) and accepted as reliable.

G.

East end of the Philadelphia and Erie Railway, compared with the Northern Central.

			Ab. ocean..
P. R. R. Datum......	....	....	6.913
Harrisburg...........	313	Above P. R. R. datum by P. R. R. profile. (Allen 1)...................	320
Bridgeport Crossing,	29	Above Harrisburg by P. R. R. profile. (Allen I)...........................	349
Do..........	30.25	Above Harrisburg by N. C. profile. (Gardner, p. 635)..................	350
Sunbury............	....	Above ocean by N. C. profile. (Allen CC.)................................	444
Do..............	428	Above ocean by P. & E. profile. (Allen CCXV).	
Do..............	430	Above ocean by Burgin's profile. (Allen CCXV).	
	16	Too low on P. & E. profile.	
	14	Too low on Burgin's profile.	
W'msport Junction,	....	Above ocean by N. C. profile. (Allen CCXVII)...........................	540
Do........do.....	516	Above ocean by P. & E. profile. (Allen CCXV).	
Do........do.....	24	Too low on P. & E. profile.	
Do.....Depot....	5.59	Below Junction by P. & E. profile. (Allen CCXV).	
		On Northern Central basis (540-6)...	534
Do........do.....	510	Above ocean by P. & E. profile. (Allen CCXV).	
Do........do.....	513	Above ocean by Burgin's profile. (Allen CCXV)	

			A.o. ocean..
W'msport Junction,	24	Too low on P. & E. profile.	
Do.........do....	21	Too low on Burgin's profile.	
Elmira...............	....	By N. C. profile. (Allen (CCXVII)..	865
..Do.................	....	By N. Y. and Erie profile. (Allen CLXII)............................	863

This last check makes the Northern Central levels appear good. The levels of the N. Y. and Erie Railway have been brought up from Jersey City, about 273 miles, and those of the Northern Central from Baltimore, 256 miles. showing a disagreement of only two feet at Elmira. It seems quite safe, therefore, to assume that the P. & E. elevations of Sunbury and Williamsport are altogether too low, as they have likewise been shown to be at Driftwood, Emporium, Irvineton, Corry, Union City and Erie.

CHAPTER XXVII.

COMPARISON OF LEVELS RUN BY JOHN H. CARLL, FEB., 1877, WITH THE A. V. RR. LEVELS. BOTH REDUCED TO THE SAME DATUM, OCEAN LEVEL.

	A. V. RR.	J. H. C.	Dif.
B. M., Union Depot, Pittsburg	745.26	745.26	....
B. M., A. V. RR. datum, Pittsburg (*a*)	741.12	741.12	0.00
Top of rail opp. 50th street, Pittsburg	737.70	738.92	+1.22
Same line from A. V. RR. datum to 50th street, re-leveled	737.70	739.04	+1.34
Top of rail opp. 4th mile post	742.10	742.97	+0.87
Do......do.... 5th....do.	746.50	747.22	+0.72
Do......do.... 6th....do.	746.70	747.36	+0.66
Do......do.... 7th....do.	745.10	746.41	+1.31
Do......do....10th....do.	745.20	745.88	+0.68
Do......do....11th....do.	755.70	757.70	+2.00
Do......do....12th....do.	778.20	778.97	+0.77
Do......do....Johnson Station	759.40	759.94	+0.54
Do......do....Logan's Station	755.10	756.65	+1.55
Do......do....Pochatoe Bridge	755.40	756.64	+1.24
Do......do....Parnassus Station	762.00	763.40	+1.40
Do......do....Arnold's Station	792.10	793.49	+1.39
Do......do....Tarentum Station	777.10	777.97	+0.87
Do......do....21st mile post	770.20	773.37	+3.17
Do......do....West Penn. Junc	789.85	790.64	+0.79
B. M. on "Sugar Tree," W. P. Junc	782.72	783.44	+0.72
B. M. on Kiskiminetis Bridge	793.21	794.00	+0.79
Top of rail opp. 33d mile post	782.70	784.33	+1.63
Do......do....White Rock Station	780.60	782.39	+1.79
Do......do....34th mile post	778.10	780.36	+2.26
Do......do....Kelly's Station	778.60	780.62	+2.02
Do......do....35th mile post	779.50	781.34	+1.84
B. M. on "Hickory 55 ft. Right"	793.35	794.52	+1.17
Top of rail opp. 37th mile post	785.10	786.50	+1.40
Do......do....Roston Station	786.90	788.39	+1.49
Do......do....41st mile post	787.60	789.77	+2.17
Do ......do....42d.....do	797.70	797.62	—0.08
Do......do....Manorville Station	796.40	797.87	+1.47
B. M. in Kittanning (*b*)	809.02	809.94	+0.92

(*a*) Top of stone foundation, of sixth post from north end, of Pittsburg and Ft. Wayne RR. Freight Depot, opposite engineer's office A. V. RR.

This bench is not marked in any manner to designate it from the other foundations of the freight depot. Mr. Blackstone, the chief engineer of the A. V. RR., personally pointed it out to John H. Carll when he commenced work, and the levels run from it to the Union Depot B. M., show precisely the same difference, 4.14′, that is given on the A. V. RR. profile.

At the first point of comparison (Fiftieth street) and at every subsequent one up to the bench-mark at West Penn Junction, the track was found to be above the railway profile. This is due no doubt to alterations of the track in some places, but the fact that the West Penn Junction B. M. appears to be 0.72′ too low, and that a difference even greater than this shows itself at the first point of comparison at Fiftieth street and continues all the way through to the junction, suggests the inquiry whether the A. V. RR. levels may not have been run in the absence of the chief engineer (who seems to be the only person able to point out the freight depot B. M.) from a point about 9 inches lower than the true bench, either by not starting from the right one of this row of pillars or by holding the rod on the second course of stone instead of on the top.

On discovering the first disagreement at Fiftieth street our line was carefully re-run from the A. V. RR. bench, and it agreed so nearly with the first line (as shown above) that no concession could consistently be made to harmonize our levels with those of the railroad engineers.

(*b*) Top of corner of curb-stone in front of the Valley Central Hotel, corner of Grant avenue and Market street, Kittanning—marked +.

Pittsburg Levels.

			Ab. ocean.
B. M. Union Depot	....	Accepted elevation....................	745.26
A. V. RR. B. M....	4.14	Below Union Depot B. M	741.12
W. P. RR. Junc. with P., Ft. W. & C. RR	6.51	Below Union Depot B. M. (Carll)....	738.75
East Lane crossing of W. P. RR.....	3.58	Below Union Depot B. M. (Carll)....	741.68

PITTSBURG LEVELS—*Continued.*

			Ab. ocean..
East Lane crossing of W. P. RR.....	743	Above ocean by W. P. RR. profile.	
East Lane crossing of W. P. RR.....	1.32	Too high by W. P. RR. profile.	
Sycamore st. cross. of W. P. RR.....	3.86	Below Union Depot B. M. (Carll)....	741.40
Sycamore st. cross. of W. P. RR.....	743	Above ocean by W. P. RR. profile.	
Sycamore st. cross. of W. P. RR.....	1.60	Too high by W. P. RR. profile.	
Connellsville Depot B. M.........	10.16	Below Union Depot B. M. (Carll)....	735.10
	735.00	Above mid-tide, Baltimore, by B. & O. RR. profile.	
	0.10	Too low by B. & O. RR. profile.	
Pittsburg Oil Well, on Boyd's Hill...	107.02	Above Union Depot B. M.............	852.28

Franklin Levels.

			Ab. ocean..
A. V. RR. Depot...	....	Accepted elevation..................	988.40
L. S. & M. S. Depot	25.33	Above A. V. RR Depot (Carll)......	1013.73
Do........do	1017	Above ocean by L. S. & M. S. RR. profile.	
Do........do	3.27	Too high by L. S. & M. S. RR. profile.	
A. & G. W. depot..	0.49	Above A. V. RR. Depot (Carll)......	988.89
Do........do	987	Above ocean by A. & G. W. RR. profile.	
Do........do	1.89	Too low by A. & G. W. RR. profile.	

Oil City Levels.

			Ab. ocean..
Union Depot.......	....	Accepted elevation..................	1008.00
Do....do	1.47	Above A. & G. W. bridge over Oil Creek, E. end (Carll).	
Do....do	1.99	Above A. & G. W. bridge over Oil Creek, W. end (Carll).	
A. & G. W. bridge.	1005.00	By A. & G. W. profile (precise point not given).	

OIL CITY LEVELS—*Continued.*

Union Depot	1006.47	By A. & G. W. RR. profile.	
Do....do	1006.99		
Do....do	1.53	Too low by A. & G. W. RR. profile.	
Do....do	1.01		
Do....do	1.61	Above L. S. & M. S. Depot, W. side, (Carll).	
L. S. & M. S. Depot	1009.80	By L. S. & M. S. RR. profile.	
Union Depot	1011.41	By L. S. & M. S. RR. profile.	
Do....do	3.61	Too high by L. S. & M. S. RR. profile.	
O. C. & A. V. Junc.	1.73	Above Union Depot	1009.73
B. M. on A. V. RR. river bridge	7.42	Above Union Depot	1015.42
South Oil City Depot	0.45	Above Union Depot	1008.45

Irvineton Levels.

			Ab. ocean.
P. & E. bridge	....	Accepted elevation	1173.00
Upper Junction O. C. & P. & E. RR.	0.39	Below P. & E. bridge	1172.61
P. & E. Depot	3.01	Below P. & E. bridge	1169.99
O. C. Depot	4.92	Below P. & E. bridge	1168.08
Lower Junction O. C. & P. & E. RRs.	3.04	Below P. & E. bridge	1169.96
D. A. V. & P. RR. Depot	2.67	Below P. & E. bridge	1170.33

Corry Levels.

			Ab. ocean.
P. & E. and A. & G. W. Crossing	.....	Accepted elevation	1427
P. & E. Depot	2.39	Above P. & E. and A. & G. W. RR. Crossing (Carll)	1429.39
Do.....do	3.66	Above P. & E. and A. & G. W. Cross. by P. & E. profile.	
A. & G. W Depot	2.29	Above P. & E. and A. & G. W. Cross. by Carll	1429.29
Do.........do	3.00	Above P. & E. and A. & G. W. Cross. by A. & G. W. profile.	
Center St. Crossing O. C. RR.	3.04	Above P. & E. and A. & G. W. Crossing (Carll)	1430.04
1st Av. Crossing O. C. RR	8.21	Above P. & E. and A. & G. W. Crossing (Carll)	1435.21
P. & E. and B. C. & P. RR. Crossing	13.02	Above P. & E. and A. & G. W. Crossing (Carll)	1440.02
P. & E. and B. C. & P. RR. Crossing	13.28	Above P. & E. and A. & G. W. Crossing by P. & E. profile.	

CORRY LEVELS—*Continued.*

			Ocean.
A. & G. W. and B. C. & P. RR. Crossing..	14.31	Above P. & E. and A. & G. W. Crossing (Carll)................................	1441.31
A. & G. W. and B. C. & P. RR. Crossing..	15.00	Above P. & E. and A. & G. W. Crossing by A. & G. W. profile.	
Logan's Summit.....	13.22	Above P. & E. and A. & G. W. Crossing (Carll)................................	1440.22
Do.......do........	13.00	Above P. & E. and A. & G. W. Crossing (Burgin).	
O.C.&B.C.&P. Junc,	14.52	Above P. & E. and A. & G. W. Crossing (Carll)................................	1441.52
Do......do	14.90	Above P. & E. and A. & G. W. Crossing (P. & E. profile and Carll).	

Union City Levels.

P. & E. Depot	....	Accepted elevation.....................	1270
U. & T. and P. & E. Junc	1.39	Lower than P. & E. Depot (Carll)	1268.61
U. & T. and A. & G. W. Cross.....	31.12	Above P. & E. Depot (Carll)...........	1301.12
A. & G. W. Depot,	29.22	Above P. & E. Depot (Carll)...........	1299.22
U. & T. and P. & E. Junc	1256.99	Above ocean by U. & T. profile.	
U. & T. and A. & G. W. Cross	1290.70	......do............do......do.	
A. & G. W. Depot,	1288.50	......do............do......do.	
P. & E. Depot......	1258.38	......do............do......do.	
U. & T. and A. & G. W Cross......	32.32	Above P. & E. Depot by U. & T. profile.	
A. & G. W. Depot,	30.12	....do........do........do........do.	

Erie Levels.

Union Depot,	....	Accepted elevation............................	686
Do......	112.36	Above Lake Erie, levels taken by J. H. Carll, March 7th, 1877, when the water was higher than ordinary.	
P. & E. and L. S. & M. S.	0.72	Higher than west end of Union Depot.	
RR. Crossing,	113.08	Above Lake Erie (Carll).	
Do.......	114	....do......do....accepted.....................	687

Elevation above ocean of a number of datum points, which have been used by engineers in this section of the State.

Brady's Bend Iron Company's "high water mark of the Allegheny river in 1865" - -	849.91
Brady's Bend Iron Company's datum "100′ below high water of 1865" - - - - -	749.91
Brady's Bend Bridge, "east abutment" - - -	857.48
Brady's Bend, "low water in Allegheny river" -	817.48
Parker & Karns City R. R. datum, "100 below the south-east corner of stone abutment of Parker bridge" - - - - -	775.67

The above are all based on the adopted levels of the Allegheny Valley R. R.

Atlantic & Great Western R. R. datum used in their former work "223.48′ below surface of Lake Erie"=573—223.48= - -	349.52
Oil City, City Engineer's datum, "25′ below the top of the centre iron plinth-block east end of Centre street iron bridge over Oil Creek." On the basis of 1,008′ for Union Depot, Oil City - - - -	980.13
Oil City, "low water in Oil Creek" relatively to City Engineer's datum - - - -	985.13
Pittsburg, city datum, (Gardner) - - - -	699.20
Pittsburg, low water, (Gardner) - - - -	699.20
Pittsburg, high water, 1852, (Gardner) - - -	729.88
Ennis Hill, Nettleton's datum in 1869 for his oil well levels - - - - - - -	1726

This last point is on the east line of the Boro' of Pleasantville. It is the highest land in Venango county. Its elevation, based on Oil City at 995′, was used in Report I, 1874, as 1,713′. We now raise it, and also all the other levels given in that report in connection with it, 13′ to make it and them conform to our present adopted ocean levels, as established in the foregoing pages.

Lake Elevations Above Ocean.

Champlain, Gardner	100.84
Ontario, Gardner	250.00
Erie, Gardner	573.08
Huron, Gardner	589.15
Michigan, Gardner	589.15
Cassadaga, Chautauqua county, N. Y., by levels of D. A. V. & P. RR.	1305
Chautauqua, Chautauqua county, N. Y., by levels of B. C. & P. RR.	1299
Conneaut, Crawford county, Pa., Report of Col. W. M. Roberts, 1840	1082
Oil Creek Lake, Crawford county, Pa., by levels of U. & T. RR.	1389
Sandy Lake, Mercer county, Pa., by levels of L. S. & M. S. RR.	1160
Conneauttee Lake, Erie county, Pa., by preliminary levels of the Penna. and Petroleum RR.	1196

Accepted Elevations above Ocean of some of the points mentioned in this discussion.

Localities.	County.	Ocean
Beaver Falls	Beaver	771
Bradford	M'Kean	? 1464
Brady's Bend (East)	Clarion	857
Brocton, N. Y	Chautauqua	724
Brookville	Jefferson	1235
Butler	Butler	1008
Carrollton, N. Y	Chautauqua	1399
Centreville	Crawford	1296
Clarksville Crossing	Mercer	938
Cochran farm	Venango	982
Cochranton	do	1065
Columbus, P. & E. Depot	Warren	1399
Corry, Union Depot	Erie	1429
Do. P. & E and A. & G. W. Crossing	do	1427
DeGolier	M'Kean	? 1510
Dilks	Butler	1307
Driftwood Junction	Cameron	815
Emlenton	Venango	905
Emporium Junction	Cameron	1022
Erie, Union Depot	Erie	686
Evansburg	Crawford	1286
Fosters	Venango	970
Foxburg	Clarion	897

Franklin, A. V. Depot		988
Do……L. S. & M. S. Depot		1014
Do……A. & G. W. Depot	….do.	989
Freeport	Armstrong	772
Garland	Warren	1309
Gilesville	M'Kean	? 2016
Great Belt City	Butler	1260
Greenville, A. & G. W. Depot	Mercer	986
Harrisburg, Market Street Depot	Dauphin	320
Herman	Butler	1301
Hickory	Venango	1092
Homewood	Beaver	949
Hydetown	Crawford	1252
Irvineton, P. & E. bridge	Warren	1173
Jamestown, N. Y., A. & G. W. Depot	Chautauqua	1321
Do……Pa., L. S. & M. S. Depot	Mercer	987
Karns City	Butler	1206
Keating Summit, B., N. Y. & P. RR	Potter	1879
Kittanning	Armstrong	810
Lawsonham	Clarion	919
Levant (N. Y.) Crossing, A. & G. W. and D., A. V. & P. RR's	Chautauqua	1267
Limestone	M'Kean	? 1415
Lincolnville	Crawford	1382
Martinsburg	Butler	1106
Meadville	Crawford	1080
Mercer, N. C. & F. Depot	Mercer	1094
Miller Farm	Venango	1131
New Bethlehem	Clarion	1080
New Castle, N. C. & B. V. Depot	Lawrence	802
Oil City, Union Depot	Venango	1008
Olean Crossing, N. Y	Chatauqua	1436
Oleopolis	Venango	1032
Orangeville	Mercer	945
Parker, A. V. Depot	Clarion	889
Petrolia	Butler	1177
Petroleum Centre	Venango	1089
Pittsburg, Union Depot	Allegheny	745
Pittsfield	Warren	1247
Raymilton	Venango	1135
Red Bank Junction	Clarion	851
Reynoldsville	Jefferson	1377
Riceville	Crawford	1369
Rochester	Beaver	706
Rouseville	Venango	1036
Salamanca, N. Y., present depot	Chautauqua	1393
Salem Crossing, A. & G. W. and L. S. & M. S. RR	Mercer	984
Saxonburg Station	Butler	1201
Scrubgrass	Venango	945
Spartansburg	Crawford	1454
Spring Creek	Warren	1392
Stoneboro, L. S. & M. S. Depot	Mercer	1168
Summit, Bradford Br., Erie RR	M'Kean	2140
Sunbury	Northumberl'd	444
Tidioute	Venango	1113
Tionesta	….do.	1060
Titusville, O. C. Depot	Crawford	1194
Tryonville Junction	….do.	1320
Union City, P. & E. Depot	Erie	1270
Do…do..A. & G. W. Depot	..do.	1299
Wampum	Lawrence	800
Warren, P. & E. Depot	Warren	1200
West Penn Junction	Westmoreland	791
Williamsport, P. & E. and N. C. Junction	Lycoming	540
Do……Depot	….do.	534
Youngsville	Warren	1214

CHAPTER XXVIII.

INDEX AND GENERAL CORRECTIONS FOR THE TABLES OF RAILROAD ELEVATIONS IN AND ABOUT THE OIL REGION OF PENNSYLVANIA. BY J. F. CARLL.

The following tables are published in this connection for the convenience and easy reference of those who may read the foregoing discussion, and who may not have a copy of Mr. Allen's more elaborate and complete report on the railroads of the State.

Our study of these levels convinces us that while they are in the main as nearly correct as may be necessary for all practical purposes, they cannot possibly be joined together in one harmonious net-work spreading over the district. Variations of a foot or two occur at almost every crossing or junction. Much must depend on good judgment in the use of these levels, for positive accuracy cannot be reached by any manipulation of the data at command.

In basing the work of this district on the tables here published we would propose to use the figures given in the 2d column, corrected in some cases as below.

I. Allegheny Valley RR., - - - Correct
II. West Penn RR., - - - - "
III. Butler Branch RR., - - - "
IV. Low Grade Division of A. V. RR., - "
V. Parker & Karns City RR., - - - "
VI. Oil Creek and Allegheny River RR., correct as far as Tryonville Junction, then drop 1 foot at Spartansburg and 4 feet at Corry.
VII. Union & Titusville RR., correct as far as Lincolnville. Union City, 1,299 feet and 1,270 feet.
VIII. Philadelphia & Erie RR., - - Correct.

IX. Atlantic & Great Western RR., correct to Jamestown, N. Y. Drop 2 feet at Corry and Union City. Correct at Meadville. Raise 2 feet at Salem Crossing and Clarksville Crossing. Mahoning Division probably nearly correct.

X. Franklin Branch A. & G. W. RR. Raise Oil City end 1 foot.

XI. Lake Shore & Michigan Southern RR., - Correct.

XII. Franklin Branch L. S. & M. S. RR. Drop all stations 3 feet.

XIII. Erie and Pittsburg RR. Doubtful; use with caution.

XIV. New Castle & Franklin RR. Drop New Castle end 1 foot; Stoneboro end 3 feet.

XV. New Castle & Beaver Valley RR. Drop all stations 1 foot.

XVI. Pittsburg, Fort Wayne and Chicago RR. Drop all stations 1 foot.

XVII. Buffalo, N. Y. & Philadelphia RR. Lift all stations from Emporium to Olean 1 foot.

XVIII N. Y. & Erie RR. Apparently 2 feet too high on the west end, and 2 feet too low on the east end.

I.

Allegheny Valley Railroad.

From RR. profile and our own levels.*

Miles fr. Pittsburg,		Ab. Ocean.	
		Profile Elevations....	Corrected levels....
0	Pittsburg, Union Depot	745	745
3.4	M'Candless		740
4.4	Sharpsburg		745
6.0	Brilliant	747	747
6.6	Waring		747
7.7	Wildwood		747
8.8	Sandy Creek		746
9.3	Armstrongs		746
9.9	Iona		746
10.3	Verona	745	746
11.2	Edgewater		761
11.8	Hulton		778
15.1	Johnson	759	760
16.5	Logan's Ferry	755	757
17.4	Parnassus	762	763
19.0	Arnolds	792	793
	Camp Ground		789
20.7	Tarentum	777	778
22.2	Chartiers		765
22.9	Soda Works		761
27.2	Garver's Ferry		785
28.8	West Penn Junction (II)	790	791
29.1	Schenley's		795
30.0	Aladdin		793
33.4	White Rock	781	782
34.6	Kelley's	779	781
36.8	Logansport		785
39.2	Roston	787	788
42.3	Manorville	796	798
44.5	Kittanning	809	810
47.7	Cowanshannoc	808	809
49.5	Pine Creek	811	812
53.8	Templeton	823	824
54.7	Mahoning	823	824
59.4	Reimerton	836	837
63.7	Red Bank Junction (IV)	850	851
65.9	Phillipsburg	854	855
68.5	Brady's Bend	856	857
71.0	Catfish	858	859
72.6	Sarah Furnace	860	861
74.0	Hillsville	864	865
78.1	Monterey	874	875
82.5	Parker (V)		889

*The figures in the second column are from our own levels as far as Kittanning. Above that point the profile levels have simply been raised one foot.

ALLEGHENY VALLEY RAILROAD—*Continued.*

Miles fr. Pittsburg.		Ab. Ocean.	
		Profile Elevations…	Corrected levels…
85.2	Foxburg	896	897
86.7	Fullerton	……	……
89.0	Emlenton	904	905
91.8	Dotters	914	915
96.7	Blacks	922	923
98.6	Rockland	926	927
101.4	St. George	934	935
103.8	Roberts Run	……	……
106.7	Scrubgrass	944	945
112.7	Brandon	960	961
115.5	Fosters	969	970
117.8	East Sandy	974	975
121.2	Cochran	981	982
123.1	Franklin (*a*)	988	988
125.6	Prentice	……	……
127.0	Reno	……	……
131.0	South Oil City (*b*) (1009.27)	1008	1009
132.0	Oil City, Union Depot (1008.82) (VI. X. XII.)	……	100

(*a*) See Franklin levels.

(*b*) The exact figures for South Oil City by these levels would be 1,009.27, and for Union Depot, Oil City, 1,008.82. We adopt 1,008 instead of 1,009 for reasons stated in the foregoing discussion.

II.

West Penn RR.

Copied from Allen's levels and corrected.

Miles from intersect'n,		Allen……	Corrected…
0	**Blairsville Intersection (*a*)**	……	**1113.00**
3	**Blairsville, Market street station**	**1011**	
8	**Livermore**	**945**	
17	**Saltzburg, Market street**	**891**	

West Penn RR.—*Continued.*

Miles from inter-section........		Allen..........	Corrected..........
	Fairbanks Coal RR. Connection	933	
	Helma	1017	
21	Salina	955	
	North West	894	
24	Roaring Run	830	
27	Apollo	823	
29	Townsend's Summit	887	
	Grinder's	827	
	Hill's Mills	780	
37	A. V. RR. Crossing (*b*) (I)	785	791.00
38	Freeport (depot) (III)	....	772.00
38½	Butler Junction (III)	....	769.00
42	Sligo	775	
43	Karn's	768	
45	Natrona	768	
46	Tarentum	757	
	Bailey's Run	753	
50	Springdale	749	
54	Harmersville	743	
	Fairview	741	
58	Ross	745	
61	Sharpsburg, Main street	739	
64	Bennett	741	
66	Allegheny City, East Lane (*c*)	743	742.00
	Junction with P., Ft. W. & C. RR., (*c*) (XVI)	....	738.75
	Union Depot B. M., Pittsburg	....	745.26

(*a*) Junction with the P. RR.

(*b*) This elevation (785′) is probably a mistake, bench-mark 783.44 at this point having been taken instead of the crossing. If this supposition be correct the West Penn levels from the Junction to Allegheny City may be presumed to be over one foot too high, for we find them here 1.56′ above correct Pittsburg datum and 1.60′ above the same at Allegheny City. (See comparison of levels and Pittsburg levels.)

(*c*) The elevations of East Lane crossing and P., Ft. W. & C. Junction in the second column were obtained by leveling from the Pittsburg Union Depot B. M., as shown in table of Pittsburg levels.

XXI.

Butler Branch West Penn R.R.

From our own levels.

Miles from intersection....		Above ocean....
	Freeport (depot)........(II)	772
0.0	Butler Junction........(II)	769
0.6	Buffalo........	766
3.2	Harbison's........	802
4.6	Monroe........	840
5.3	Sandy Lick Station........	887
7.6	Sarver's........	1027
10.5	Saxonburg Station........	1201
11.5	Delano........	1224
13.2	Dilk's........	1307
13.4	Summit........	1317
14.3	Great Belt City........	1260
	Summit........	1302
16.0	Herman........	1301
21.0	Butler (*a*)........	(1008)

(*a*) Our line was not run above Herman Station. The elevation of Butler is supplied from the R.R. profile, but probably is very near correct.

IV.

*Low Grade Division, A. V. RR.**

Copied from Allen's levels and corrected.

Miles from Driftwood........		Profile elevat'ns	Corrected levels above ocean...
0	Driftwood Junction	788	814
	Mix Run	848	874
7.1	Miller's	880	906
8.4	Dent's Run	898	924
	Enz	938	964
12.0	Grant	949	975
	Mount Pleasant	973	999
	Devil's Elbow	993	1019
16.3	Benezette	1014	1040
	Meadic's Run	1073	1099
	Caledonia Tunnel	1122	1148
	Slabtown Dam	1163	1189
	Hebner's Run	1245	1271
	Clear Run	1385	1411
	Slab Run	1381	1407
47.4	Falls Creek	1381	1407
	Crooked Run	1378	1404
	Evergreen	1374	1400
52.0	Maghee's	1361	1387
	Panther's Run	1362	1388
54.1	Reynoldsville	1351	1377
	Prior Run	1342	1368
	Prindible's	1335	1361
	M'Annutty	1335	1361
	Camp Run	1317	1343
60.7	Fuller's Mill	1301	1327
	Wolf Run	1295	1321
	Cable Run	1285	1311
63.6	Iowa Mill	1273	1299
	Goose Neck	1256	1282
66.5	Bell's Mill	1340	1366
	Garrison's Mill	1235	1261
69.4	Brookville	1209	1235
	Nickolson's Mill	1199	1225
	Corder's Run	1200	1226
71.7	Puckerty Point	1189	1215
	Rattlesnake Run	1183	1209
	Baxter's Mill	1181	1207
	Heathville	1137	1163
	Motter's Run	1124	1150

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*These levels were supposed to be based on P. RR. datum at Philadelphia, as given on Mr. Burgin's profile of the P. & E. R'y. According to this profile Driftwood is 788′+7′=795′ above ocean. But we find this altogether too low, and are obliged to lift the whole line of levels 19′ more, or 26′ in all, above the original RR. profile, as given by Mr. Allen, to bring Red Bank Junction up to the accepted level of the A. V. R'y at that point.

LOW GRADE DIVISION, A. V. RR.—*Continued.*

Miles from Driftwood........		Profile elevat'ns,	Corrected levels above ocean...
	Bear Tree Run	1107	1133
84.5	Maysville	1082	1108
	Pine Run	1075	1101
86.4	Millville	1067	1093
	Indiantown Run	1063	1089
	Middle Run	1060	1086
89.7	New Bethlehem	1054	1080
	Anthony's Neck	1025	1051
95.0	Leatherwood	1001	1027
97.5	Rock Run	940	966
	Buck Lick Run	913	939
	Lawsonham	893	919
	Fiddler's Run	889	915
110.0	Red Bank Junction (I)	825	851

V.

Parker & Karns City RR.

Copied from Mr. Allen's levels and corrected.

	Ab. datum,	Ab. ocean..
Datum (*a*)	....	775.67
Parker Junction (*b*) (I)	....	889.40
Parker City	....	....
Stone House (*c*)	315.00	1069.00
Martinsburg	330.00	1106.00
Argyle	386.80	1162.00
Petrolia	401.00	1177.00
Central Point	410.00	1186.00
Karns City	430.30	1206.00

(*a*) The datum of this road is 103.99′ below the top of the freestone base of the toll house at the west end of the bridge; this was found to be 9.74′ below the Parker depot of the A. V. RR. Parker Depot is 889.40′ above ocean, consequently the Karns City RR. datum must be 889.40′—113.73′=775.67′ above ocean.

(*b*) With A. V RR. east end of Parker bridge.

(*c*) 315 in Mr. Allen's tables should have been 293 as the RR. profile shows.

VI.

Oil Creek & Allegheny River RR.

The elevations in the first column were copied from the profile in the office of the company at Oil City, February, 1877, through the kindness of Mr. Frank M. Ashmead, Resident Engineer.

The datum is given as follows: "Elevation of track on Bridge east of Irvineton Station on P. & E. RR. above tide water at west end of Market street bridge, Philadelphia = 1,160".

To the profile elevations 13′ have been added to raise them up to the corrected ocean level of Oil City and Irvineton as given in the second column. This lifts the Corry end of the road four feet too high to agree with our accepted elevation of that point, which is due no doubt to errors in the profile between Tryonville and Corry, as shown in the foregoing discussion of relative levels.

Miles from Irvineton......		Profile elevat'ns	Above ocean....
......	**Brokenstraw Bridge, Irvineton top of Track (*a*) (VIII)**	**1160**	**1173**
......	**Irvineton Junction (*b*) (VIII)**	**1157**	**1170**
0	**Irvineton Depot (*c*)**	**1155**	**1168**
2.6	**Dunn's Eddy**	**1143**	**1156**
4.1	**Penna. House**	**1138**	**1151**
6.6	**Thompson's**	**1130**	**1143**
8.9	**Cobham**	**1124**	**1137**
11.1	**Magee**	**1118**	**1131**
14.8	**Tidioute**	**1100**	**1113**
20.1	**Trunkeyville**	**1086**	**1099**
23.3	**Hickory**	**1079**	**1092**
26.2	**Dawson's**	**1063**	**1076**
28.1	**Jamison's**	**1061**	**1074**
29.6	**Tionesta**	**1047**	**1060**

Oil Creek & Allegheny River RR.—*Continued.*

Miles from Irvineton......		Profile elevat'ns,	Above ocean....
32.5	Hunter's	1048	1061
34.9	Stewart's Run or Baum	1034	1047
36.8	President	1035	1048
38.0	Eagle Rock	1033	1046
39.3	Henry's Bend	1022	1035
41.3	Oleopolis	1019	1032
43.2	Walnut Bend	1010	1023
46.5	Rockwood	1003	1016
50.2	Oil City (I. X.XII)	995	1008
52.7	M'Clintock, (Old Sta. =1,048)	......	......
53.4	Rouseville	1023	1036
54.4	Rynd Farm	1030	1043
55.6	Tarr Farm	1050	1063
56.1	Columbia	1054	1067
57.6	Petroleum Centre	1076	1089
58.1	Boyd Farm	1073	1086
59.1	Pioneer	1086	1099
61.3	Shaffer	1118	1131
62.3	Miller Farm	1118	1131
67.2	Titusville (VII)	1181	1194
71.4	Hydetown	1239	1252
	Gray's Mill	1266	1279
75.9	Tryonville Junction (VII)	1307	1320
78.7	Centreville	1283	1296
82.3	Glynden	1335	1348
85.4	Spartansburg	1442	1455
93.5	Corry, B. C. & P. Junction	1433	1446
94.3	Corry Depot (VIII. IX)	1420	1433
94.4	Corry Crossing P. & E. and A. & G.W. RR., (*d*) (VIII.IX)	(1418)	(1431)

(*a*) The levels of this road were based on 1160′ as the elevation of the Brokenstraw Bridge above the P. R. R. datum at Philadelphia. No authority is given in the engineer's notes, and it appears to be a mistake, both as to the elevation and the datum from whence derived.

(*b*) On P. & E. profile=1158.80.

(*c*) The point here referred to is on the O. C. & A. R. R. R. track, on the south side of the P. & E. depot, and is 1.91′ lower than the P. & E. track.

(*d*) Corry depot is given on the profile as **1420.23′**. The crossing of the P. & E. and A. & G. W. R. R. is 2.29′ lower, consequently the O. C. & A. R. elevation of the crossing would be 1418′ as supplied. The adopted elevation of this point is 1427′, and of Corry depot 1429′.

VII.

Union and Titusville RR.

Same authority and same correction as O. C. & A. R. Ry.

Distances.		Profile elevat'ns	Corrected levels,
0	Titusville (*a*) (VI)	1181	1194
8.7	Tryonville Junction (VI)	1307	1320
10.5	Nobles	1285	1298
14.0	Riceville	1356	1369
16.1	Lincolnville	1369	1382
17.2	Lakeville	1399	1412
24.4	A. &. G. W. Crossing	1291	1304
24.8	Union City P. & E. Depot (*b*) (VIII)	(1258)	(1271)
24.8	Union City P. & E. Junction	1257	1270
24.9	Union City A. & G. W. Depot (*c*) (IX)	1288	1301

(*a*) This road uses the O. C. & A. R. RR. track from Titusville to the Junction.

(*b*) This elevation was supplied by our levels from the Junction. The adopted elevation is 1,270′.

(*c*) Adopted elevation, 1,299′.

VIII.

Philadelphia & Erie RR.

The figures in the first column are copied from a profile published by Mr. J. F. Burgin, C. E., in 1862.

Datum "tide water at west end of Market Street Bridge over Schuylkill, Philadelphia." [An error.]

The elevations in the second column are from our own levels run from Lake Erie to Union City, in March, 1877. Beyond Union City we have continued our corrected elevations by raising the Burgin profile 11′ at all points. This is required to bring the road up to the horizon of the levels carried up from Pittsburg, and seems to be warranted by the fact that the old levels start 11′ too low at the L. S. & M. S. crossing. These points are more fully explained in the discussion of relative levels.

Miles from Erie,		Profile elevations	Corrected elevation ab. ocean..
	Lake Erie	565	573
	Erie Freight Depot (*a*)	573	584
0	Erie Union Depot (XI)	......	686
1	L. S. & M. S. RR. Crossing (XI)	676	687
7	Belle Valley	994	1007
9	Langdons	1123	1137
13	Jacksons	1218	1229
19	Waterford	1181	1192
23	Le Bœuf	1205	1218
26	Union City (VII)	1259	1270
32	Concord	1372	1383
34	Lovells	1363	1374
36½	Logan's Summit	1429	1440
36½	B. C. & P. RR. Crossing	......	1440
37	Corry (VI. IX)	......	1429
37	A. & G. W. RR. Crossing (VI. IX)	1416	1427
	Columbus	1388	1399
44	Spring Creek	1381	1392
50	Garland	1298	1309
54	Pittsfield	1236	1247
57	Youngsville	1203	1214
	Irvineton Junction (VI)	......	1170
60	Irvineton Depot (*b*)	......	1170
	Irvineton Bridge (VI)	1162	1173
66	Warren	1189	1200

(*a*) See preceding discussion of levels.

(*b*) This Depot is 1.91′ higher than the O. C. & A. RR. Depot track.

P. & E. RR. Levels

From Erie to Union City, as run by John H. Carll and Arthur Hale, March, 1877.

Miles from Erie,		Above ocean...
0	Erie Union Depot	686
1.0	L. S. & M. S. Crossing	686.72
3.0	Opp. Mile Post	759.64
4.0	....do..... do	828.82
4.2	B. M. on north end of E. wall of Culvert at Road Crossing	839.27
5.0	Opp. Mile Post	901.60
6.0	..do......do	978.97
6.7	..do..Belle Valley Sta	1007.19
7.0	..do..Mile Post	1007.15
8.0	..do......do	1076.78
8.9	..do..Langdons Sta	1136.85
9.0	..do..Mile Post	1135.69
10.0	..do......do	1155.26
11.0	..do......do	1186.81
12.0	..do......do	1218.37
12.4	Jackson Sta. Road Crossing	1229.46
13.0	Opp. Mile Post	1224.50
14.0	. do......do	1219.97
14.7	B. M., east abut., north end, inside corner, Bridge No. 8	1214.54
15.0	Opp. Mile Post	1212.58
16.0	..do......do	1209.11
17.0	..do......do	1206.31
17.4	B. M. on east abut., north end, inside corner, Bridge No. 13,	1206.84
18.0	Opp. Mile Post	1201.31
18.5	..do..Waterford Sta	1192.66
18.6	B. M., east wall, north end, inside corner, Culvert	1190.60
19.0	Opp. Mile Post	1191.92
20.0	..do......do	1200.88
21.0	..do......do	1221.13
22.0	..do......do	1218.14
22.9	Le Bœuf Road Crossing	1217.08
23.0	Opp. Mile Post	1212.14
23.4	B. M., E. abut., lower end, outside corner, Bridge No. 18	1211.27
23.9	..do........do........do..........do..........do...No. —	1213.64
24.0	Opp. Mile Post	1218.51
24.9	B. M., E. abut., lower end, inside corner, Bridge No. 21	1235.68
25.0	Opp. Mile Post	1238.80
25.9	B. M., E. abut., lower end, outside corner, Bridge No. —	1260.24
26.0	Opp. Mile Post	1263.53
26.3	..do..Union City Depot	1269.63

IX,

Atlantic & Great Western RR.

Copied for the Survey by Mr. C. D. Allis, Assistant Engineer, from the railway profile.

Miles from Salamanca……		Above Lake Erie,	Above ocean….
0	Salamanca, Center Hemlock St., (*a*) (XVIII)	820	1393
	Bucktooth	803	1376
7	Red House	780	1353
12	Steamburg	831	1404
18	Randolph	745	1318
	Waterboro'	703	1276
25	Kennedy	691	1264
	Poland	696	1269
	Levant D., A. V. & P. RR. Crossing	694	1267
34	Jamestown	748	1321
41	Ashville	783	1356
45	Watts Flats	883	1456
48	Grant	864	1437
	N. Y. & Penn'a State Line	895	1468
51	Bear Lake	977	1550
58	Columbus	854	1427
	P. & E. RR. Crossing, (*b*) (VI. VIII)	856	1429
61	Corry, (*c*) (VI. VIII)	858	1431
	B. C. & P. RR. Crossing	870	1443
	Concord	788	1361
72	Union City, (*d*) (VII)	728	1301
79	Mill Village	643	1216
85	Millers	596	1169
88	Cambridge	590	1163
92	Venango	590	1163
96	Saegertown	543	1116
102	Meadville (X)	507	1080
	Junction Franklin Branch, (X)	501	1074
110	Geneva	496	1069
116	Evansburg	711	1284
121	Adamsville	575	1148
	Sugar Grove	467	1040
	Crossing of Franklin Branch, L. S. & M. S. RR., (*e*) XII,	409	982
129	Greenville	411	984
131	Shenango	363	936
	E. & P. RR. Crossing, (*f*) (XIII)	363	936
135	Transfer	420	993
	Crawfords	320	893
141	Orangeville	372	945
	Penn'a & Ohio State Line	372	945
145	Burghill	471	1044
	Johnson's Summit	553	1126
154	Baconsburg	426	999
162	Warren	327	900
165	Leavittsburg	322	895
	Crossing Mahoning Division	334	907

(*a*) See Review (F.) A. & G. W. levels.
(*b*) Adopted elevation 1,427.
(*c*) Adopted elevation 1,429.
(*d*) Adopted elevation 1,299.
(*e*) Near Salem, adopted elevation 984.
(*f*) Clarksville Crossing, adopted elevation 938.

Mahoning Division A. & G. W. RR.

Miles fr. Leavittsburg........		Above Lake Erie	Above ocean....
0	Leavittsburg	322	895
	Crossing Main Line	334	907
	Phalanx	345	918
9	Mahoning	370	943
13	Garrettsville	446	1019
19	Mantua	538	1111
26	Aurora	531	1104
	Pond	470	1043
34	Solon	468	1041
	Randal	473	1046
44	Newburg	240	813
	C. & P. crossing (*a*)	175	748
49	Cleveland	24	597
	Lake Erie, surface of water	00	573

(*a*) Mr. I. Linton, Chief Engineer of the C. & P. RR., has kindly given us the elevation of this point by the C. & P. profile. "It is 173.64′ above the surface of Lake Erie; water level of 1848."

X.

Franklin Branch A. & G. W. RR.

Same authority as A. & G. W. main line.

Miles from Meadville........		Above Lake Erie	Above ocean....
0	Meadville..(IX)	507	1080
3	Junction..(IX)	501	1074
6	Shaw's Landing..	519	1092
11	Cochranton..	491	1064
14	Carlton..	474	1047
19	Utica..	462	1035
24	Sugar Creek..	441	1014
28	Franklin (*a*)..	414	987
33	Reno..	438	1011
36	Oil City, west side..	433	1006
	Oil City, Union Depot, (*b*)....................(I, VI, XII)	......	(1007)

(*a*) See Franklin levels.

(*b*) Supplied; see Oil City levels. Adopted elevation, 1,008′.

XI.

Lake Shore and Michigan Southern RR.

Copied from Allen's levels.

Miles from Dunkirk........		Above Lake Erie	Above ocean....
0	Dunkirk..(XVIII)	25	598
4	Morian's..	53	626
9	Brocton..	151	724
	Portland..	121	694
17	Westfield..	124	697
	Ripley Crossing..	163	736
25	Ripley..	177	750
28	State Line..	212	785
33	North East..	231	804

LAKE SHORE AND MICHIGAN SOUTHERN RR.—*Continued.*

Miles from Dunkirk,		Ab'e Lake Erie.....	Ab. ocean,
37	Moorhead	195	768
40	Harbor Creek	157	730
44	Wesleyville	124	697
	P. & E. RR. Crossing (*a*) (VIII)	(114)	(687)
48	Erie, Union Depot (VIII)	113	686
56	Swanville	162	735
58	Fairview	162	735
63	Girard	144	717
64	E. & P. RR. Junction (*b*) (XIII)	(126)	(699)
68	Springfield	90	663
75	Conneaut	78	651
	Amboy	108	681
83	Kingsville	98	671
88	Ashtabula (XII)	75	648

(*a*) See Erie levels.

(*b*) Girard Station, on the L. S. & M. S., is given as 143.72′. J. H. Carll found the E. & P. Junction to be 18.17′ below the station, making the Junction 143.72—18.17=125.55′.

XII.

Franklin Branch L. S. & M. S. RR.

Same authority as main line.

Miles from Oil City,		Ab'e Lake Erie.....	Ab. ocean,
0	Oil City, Union Depot (*a*) (I.VI.X)	.....	(1011)
1.1	Oil City, West Side	437	1010
4.7	Reno	444	1017
7.2	Two-Mile Run	422	995
9.3	Franklin (*b*)	444	1017
15.8	Summit	592	1165
18.1	Polk	511	1084
22.3	Raymilton	565	1138
	Naples	592	1165
29.8	Stoneboro (*c*) (XIV)	598	1171
31.3	Coal Branch	626	1199
35.5	Clark's	591	1164
38.8	Hadley's	497	1070
44.3	Salem	425	998
46.1	A. & G. W. RR. Crossing (*d*) (IX)	414	987

FRANKLIN BRANCH L. S. M. S. RR.—*Continued.*

Miles from Oil City...		Above Lake Erie......	Above ocean
51.1	Jamestown	417	990
54.2	Turner	487	1060
57.2	Simon	484	1057
62.8	Andover	522	1095
66.6	Leon.		
70.4	Dorset	445	1018
76.4	Jefferson	368	941
79.8	Griggs.		
82.4	Plymouth	281	854
87.2	Ashtabula (XI)	75	648

(*a*) See Oil City levels. Adopted elevation, 1,008′.
(*b*) See Franklin levels. Adopted elevation, 1,014′.
(*c*) Adopted elevation, 1,168′.
(*d*) Near Salem. Adopted elevation, 984′.

Wherever checked this road appears to be about 3′ too high.

XIII.

Erie & Pittsburg RR

Copied from Allen's levels.

Miles from New Castle		Above Lake Erie......	Above ocean
0	New Castle (*a*)	236	809
5	Harbor Bridge	243	816
	Nashua	248	821
11	Pulaski	253	826
15	Middlesex	260	833
18	Wheatland	268	841
20	Sharon	280	853
23	Sharpsville	375	948
27	Clarksville	321	894
30	Transfer	417	990
	A. & G. W. Crossing (*b*) (IX)	357	930
34	Shenango	368	941
35	Greenville	388	961
41	Jamestown (*c*)	406	979
	Kasson's	538	1111
51	Espyville	515	1088

ERIE & PITTSBURG RR.—*Continued.*

Miles from New Castle		Above Lake Erie......	Above ocean
55	Linesville	460	1033
59	Summit	586	1159
63	Conneautville	493	1066
66	Spring	388	961
72	Albion	284	857
78	Crosses	192	765
82	Junction L. S. & M. S. RR. (*d*) (XI)	124	697

(*a*) 803 on N. C. & B. V. Perhaps not the same points.

(*b*) Adopted elevation 938′. See review F.

(*c*) 990 on L. S. & M. S., and L. S. & M. S. depot is really lower than the E. & P. depot.

(*d*) Two feet too low. See note b XI.

This whole list of levels appears very unreliable.

XIV.

New Castle & Franklin RR.

Copied from Allen's Levels.

	Above Lake Erie	Above ocean....
New Castle (*a*) (XV)	230	803
Junction (XV)	221	794
East Brook	333	906
Graham's	334	907
Wilmington	355	928
Neshannock Falls	419	992
Volante	462	1035
Leesburg	472	1045
Nelson	487	1060
Hope Mills	534	1107
Mercer	524	1097
Turner's	571	1144
Jackson Centre	684	1257
Garvin	754	1327
Summit	815	1388
Coulson	704	1277
Stoneboro (*b*) (XII)	598	1171

(*a*) This elevation is based on 746′ for Union Depot, Pittsburg, consequently all the following levels are one foot too high to agree with our lines run from the Pittsburg datum of 745′.

(*b*) Adopted elevation 1168. See D, note (*a*).

XV.

New Castle & Beaver Valley RR.

Copied from Allen's Levels.

	Above Lake Erie	Above ocean....
Homewood (*a*) XVI	377	950
Clinton	327	900
Thompson's	287	860
Wampum	228	801
Newport	239	812
Moravia	233	806
Lawrence Junction	201	774
Mahonington	216	789
Junction New Castle & Franklin RR. (XIV)	221	794
New Castle (XIV)	230	803

(*a*) This is the P., F. W. & C. elevation of Homewood, which is based on 746′ for Union Depot, Pittsburg, instead of 745′. All the stations in this table should be lowered one foot to make them agree with our levels.

XVI.

Pittsburg, Fort Wayne & Chicago RR.

Copied from Allen's Levels.

Miles from Pittsburg........		Above Lake Erie	Above ocean....
0	**Pittsburg Union Depot** (*a*)....................	173	746
	Junction with West Penn RR. (*b*).................... (II)	......	(739)
1	**Allegheny**....................	166	739
	Outer Depot....................	192	765
	Wood's Run....................	159	732
	Jack's Run....................	156	729
	Bellevue....................	156	729
7	**Emsworth**....................	153	726
8	**Dixmont**....................	150	723
	Glendale....................	149	722
9	**Haysville**....................	149	722
12	**Sewickley**....................	164	737
	Edgeworth....................	153	726
13	**Leetsdale**....................	143	716
	Fair Oaks....................	143	716
15	**Economy**....................	143	716
	Economy Switch....................	143	716
18	**Baden**....................	138	711
21	**Remington**....................	138	711
22	**Freedom**....................	131	704
24	**Rochester**....................	134	707
26	**New Brighton**....................	178	751
29	**Beaver Falls**....................	199	772
	Sullivan....................	293	866
	Wallace Run....................	323	896
30	**Homewood**.................... (XV)	377	950

(*a*) 745′ is our adopted elevation of this point. These levels should therefore all be dropped one foot to make them agree with our lines.

(*b*) See Pittsburg levels.

XVII.

Buffalo, New York & Philadelphia RR.

Copied from Allen's Levels.

Miles from Emporium		Above Lake Erie	Above ocean
0	**Emporium**	448	1021
6	**Shippen**	630	1203
14	**Keating Summit**	1305	1878
17	**Liberty**	1070	1643
24	**Port Allegheny**	906	1479
32	**Larabee's**	905	1478
38	**Eldred**	867	1440
42	**State Line**	867	1440
45	**Portville**	866	1439
52	**Olean Crossing of N. Y. & Erie RR. (*a*)........ (XVIII)**	862	1435
58	**Hindsdale**	880	1453
64	**Ischua**	965	1538
71	**Franklinville**	1017	1590
78	**Machias**	1080	1653
82	Yorkshire	882	1455
85	Arcade	881	1454
92	Protection	807	1380
95	Holland	600	1173
99	South Wales	414	987
104	Aurora	348	921
106	Jamieson	317	890
108	Elma	250	823
110	Spring Brook	180	753
114	Ebenezer	63	636
121	Buffalo	11	584

(*a*) This point is said to be about the same elevation as the Olean Station on the Erie RR. Adopted elevation 1436′. See A.

XVIII.

N. Y. & Erie RR.

Copied from Allen's levels.

Distances.		Above ocean.
0	Dunkirk (*a*) (XI)	600
8	Forestville	883
12	Smith's Mills	1010
	Persia	1390
31	Cattaraugus	1411
38	Little Valley	1594
46	Salamanca (*b*) (IX)	1384
49	Great Valley	1393
52	Carrollton	1399
	Carrollton Junction	(1400)
	Vandalia	1415
61	Allegheny	1422
65	Olean (XVII)	1438
	Hindsdale	1501
	White House	1514
77	Cuba	1542
	Cuba Summit	1698
86	Friendship	1539
90	Belvidere	1384
94	Philipsville	1390
	Scio	1458
102	Genessee	1511
110	Andover	1676
	Tip Top Summit	1783
128	Hornellsville	1161
132	Canisteo	1134
	Adrian	1112
	Santees	1067
	Cameron	1056
149	Cameron Mills	1029
157	Rathboneville	1015
162	Addison's	993
	Erwin's	983
171	Painted Post	947
173	Corning	942
190	Elmira	863

(*a*) The L. S. & M. S., N. Y. & Erie and D., A. V. & P. railroads all use the same depot at this point. Levels were run from it to the lake by J. H. Carll, April 4, 1877, with the following results. Top of track at west end of depot, 25.63′ above surface of lake. D., A. V. & P. Junction with L. S. & M. S. (near east end of depot) 26.16′ above lake. [598′ adopted.]

(*b*) See review (F) A. & G. W. levels; adopted elevation of present depot, 1,393′.

Elevation above Ocean of a number of points on the Titusville and Pithole Plank Road, Venango county. Centre of road when not otherwise mentioned. From our Pleasantville and Church Run line of 1874.

Opposite office of Hinkley Refinery, - - - -	1196
S. E. cor. of porch of Johnston House, E. Titusville,	1192
Crossing of D., A. V. and P. RR., top of rail, - -	1184
Pine Creek Bridge, top of stringer, E. end, - -	1186
" " surface of water (ordinary), - - -	1174
Intersection of Plumer road, - - - - - -	1237
Opp. large pine, top of "1st M'Gee hill," - -	1308
Opp. spring on M'Gee hill slope, - - - -	1397
Crown of M'Gee hill, - - - - - - -	1511
Culvert over head of M'Gee run, - - - -	1525
Intersection of Shamburg road, - - - -	1576
Intersection of road in front of J. Y. Siggins', -	1647
Highest point on Siggins' hill, - - - -	1694
B. M. on oak near Parshall's corners, - - -	1674
Highest point of hill opposite M. C. Beebe's, - -	1686
Culvert over branch of W. Pithole, Pleasantville, -	1620
Top sandstone water table, N.W. cor. Pleasantville Bank,	1635
B. M. on foundation of tower of Presbyterian Church,	1656
Intersection of Dunham road, - - - - - -	1654
Intersection of Clark Farm road. - - - -	1671
Crown of hill S. E. of toll house, - - - - -	1659
Top of Tyrrell hill, - - - - - - - -	1653
B. M. rock in front of Tyrrell Farm school house, -	1532
Bridge over Dunham run, - - - - - -	1518
B. M. on rock corner F. and Warren pike, opposite Farmer's Hotel, - - - - - - -	1523
Intersection of Tionesta road, - - - - -	1530
South line of Bean Farm, - - - - -	1506
Surface of water in Dunham run, - - - -	1406
B. M. on rock S. end of Haworth's mill, - - -	1391
Bridge over Pithole creek, - - - - -	1386
Surface of water, Pithole creek, - - - -	1380
B. M. on rock by old road leading to Cashup, - -	1522
Intersection of Holmes' Avenue to Cashup, - -	1583
Crown of Ruggs' hill, - - - - - -	1587

West entrance to Cashup, - - - - - -	1501
B. M. on rock near Peck well, Dawson Centre, -	1360
Bridge over Pithole creek, Dawson Centre, - -	1359
Surface of water, Pithole creek, Dawson Centre, -	1351
B. M. on large rock S. of road opp. Minor's W. well,	1397
Square stone monument near the old Homestead well, and on a level with well mouth, said to be on township line, - - - - - - - - - -	1340
Depot of Pithole and Oleopolis RR, . - -	1320

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